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EXPLORING THE GLORIES OF THE FIRMAMENT.

BY WILLIAM JOSEPH SHOWALTER.

DEALING with distances in the endless reaches of space where a million miles are but as an inch in terrestrial measurements; studying worlds that are as much larger than ours as a mountain is bigger than an ant-hill; gauging the velocities of celestial travelers that outfly the speediest Spad that ever chased a Hun as an express train outruns a snail; reckoning with forces that make the tremendous eruptions of a Katmai seem weaker than the bursting of a mustard seed, the astronomer is an explorer of realms that overpower the layman's comprehenson and overwhelm his imagination.

But luckily this lapman can check up the celestial geographer in a way at once dramatic and convincing. The grapes brought back by Joshua when he was sent to spy out the Promised Land were not half as sure a corroboration of his story as are the fulfilled prophecies the astronomer brings back from his incursions into the depths of space.

He tells of stars that are trillions—aye, sextillions—of miles away; of suns that are hundreds, and even thousands of times as bright as the orb of our day; of forces that are thousands, and even millions, of times as great as the power with which the earth sweeps round the sun.

The Astronomer at the Bar.—Does he know what he is talking about? Let us put him on trial and see. Our witnesses shall be heavenly bodies and forces themselves. The first one we shall call, out of the thousands who could testify, is a comet—Halley's. Here is its evidence:

"Yes, I'm a comet. For countless generations I had been swinging through space. When I approached the earth men believed me a messenger of evil. They knew precious little about me or my kind. In 1682 I appeared on one of my excursions into realms bounded by the earth's orbit. A little before that Sir Isaac Newton had worked out the fundamental principle of celestial mechanics, namely, the law of gravitation.

"He had a friend by the name of Halley. This man undertook to see whether or not I was subject to that law, and whether, indeed, Newton's interpretation of it was correct. Looking back over the twenty-four comets that had been recorded as invading the precincts of space set aside for the earth, he found that three of them had traveled a similar path and all the others diverse paths.

"Applying Isaac Newton's law to me, he said that I was traveling thirty-four miles a second when I was nearest the sun, and that I had turned round and was headed for the regions whence I had come. He said I would travel out into space some three billion miles, my gait slowing down as I journeyed, and that when I got ready to make the turn to come back I would be loafing along at the celestial snail's pace of a mile a second.

Predicted 75 Years Ahead.—"Furthermore, he figured out my mass and many other details about me. Then he said that if he was right I would come back in about seventy-six years, the exact month of my coming depending on how much influence Jupiter and other planets would have upon me, which he had not had time to calculate.

"I knew that he had fathomed my

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mystery and solved my secret. But the people of the earth did not. They said: 'Oh, yes, Halley is a cheap-John notoriety-seeker. He is trying to get fame by a prediction that will attract attention, but he postpones the date of the comet's reappearance to a time when he is dead and his forecast forgotten!'

"But Halley 'stood pat' and called on an impartial posterity to witness that it was an Englishman who had first predicted the return of a comet. Sure enough, in the language of the street, 'he had my number.' With less proportionate departure from his schedule than the Congressional Limited makes in its Washington-New York run, I reappeared, having traveled some seven billion miles in the interim. So I have to admit that Halley must have known what he was talking about.

Sirius, King of the Starry Empire, Testifies.—The next witness is a star—Sirius by name. His evidence may be somewhat self-incriminating, but perhaps it is even more valuable therefor. It makes the seven billion miles that Halley's comet travels between its earthly visits seem only a morning constitutional. Here's his testimony:

"For untold centuries I had been shining down upon the sons of men with my bluish-white light. I was the king of kings of the starry empire, ruling my own constellation, *Canis Major,* and at the same time excelling all of the other stars of the heavens for brightness. I am third among fixed stars—that is, those outside the solar system—in nearness to the earth, but I was to men only a star and nothing more. They called me the 'Dog Star' and said my constellation was one of the hounds of Orion.

"But one day that man they call Edmund Halley got to studying my habits. He made a series of notations in the year 1718 to the effect that I was not behaving as fixed stars are supposed to deport themselves, drawing attention to the fact that I frequently changed my position on the path I was traveling. He hinted that it might be that I was departing from the straight and narrow way, though he made no charges that such was the case.

"More than a century later another astronomer came along—Bessel was his name—and he undertook to interpret my behavior. Although I was forty-seven trillion miles away from him, he and his pupil, Peters, pronounced me a 'gay dog,' with an affinity they could not see, though only because they lacked telescopes powerful enough. They said my affinity and I were coming in the sun's direction, overtaking that luminary at the rate of nearly six miles a second, and that we traveled around a common center of gravity once every 48.8 years.

"Another half century passed, and meanwhile telescopes were undergoing improvement. The circumstantial evidence against me was mighty strong, but still no one had yet seen my affinity, and I felt pretty safe. Then came along that gifted optician, Alvan G. Clark. He was adjusting what is now the Dearborn Observatory telescope. When he trained that instrument on me, I saw that the jig was up with my secret. My affinity herself was seen, and I have to admit that Bessel and Peters knew what they were talking about."

The next witness is a planet, Neptune.

Neptune Tells His Story.—"If you please, sir, I long flattered myself with the thought that I was an uncle that you Earth-ites never knew you had. I am an elder brother of Mother Earth, though for ages and ages she and her children never suspected my existence.

"But back in the 'forties' of the nineteenth century my brother Uranus overtook me in our Marathon around the sun. Though our track is a billion miles wide and he has the rail, yet whenever he passes me I fret him so much that he gets a case of 'nerves.'

"Two astronomers, Adams, of England, and Leverrier, of France, each working without knowing that the other was engaged on the same problem, undertook to diagnose my brother's case of nerves and to explain his perturbations. Each finally reached the conclusion that the trouble was caused by me, as yet an undiscovered planet.

"They figured that I, though undiscovered, must be nearly a billion miles father out in space than Uranus; that I must be eighty-five times as big and sixteen times as heavy as the earth. They also calculated that I must have a year twice as long as that of Uranus and 165 times as long as the earth's.

"They said that the perturbations of Uranus were due to the fact that every now and then he got between the sun and this hypothetical me, and that the rival pulls of the sun and myself upon him were responsible for his nervousness. And then they, in effect, made a most audacious prophecy. They said that if they were right about it I would put in my appearance at a certain hour, on a certain day, in a certain spot of the heavens, to answer whether their conclusions were right or not.

"And sure enough, I was right there, Johnny-on-the-spot, exactly on schedule time and in my assigned position. I am

quite ready to testify, therefore, that a man who can project his mind nearly three billion miles into space and recognize my unseen presence by the effect I have on my brother comes pretty near to knowing what he is talking about."

Our next witness as to the credulity of astronomers is a ray of light. We will hear its story:

"Yes, I am a ray of light. Once men thought I was instantaneous. They tried by various devices and expedients to ascertain whether I was or not. But by no experiment they could make were they able to discover that it required any interval of time for me to pass from one place to another.

"However, a man by the name Roemer finally found that an eclipse of Jupiter's moons seemed to occur about sixteen minutes later when the earth was on the side of the sun away from Jupiter than when on the side nearest that planet.

"He concluded that this was not because the moons were behind time, but because it took me sixteen minutes longer to come to the earth when crossing its orbit than when not having this extra distance to travel. Here was evidence that I was not instantaneous and indications that I travel at the rate of about eleven million miles a minute.

"But these astronomers were not satisfied with that deduction of the tests that followed. Finally Dr. Simon Newcomb and his associate, the talented Professor Michelson, decided to put me to a test I could not dodge.

Devising Speedometer for Light. — "They erected a great revolving mirror in the grounds at Fort Myer, overlooking the Washington Monument, 2½ miles away. At the latter's base they set up a stationary mirror. Then they turned the revolving mirror at the rate of 250 revolutions a second, which sent me hurtling through space toward the fixed reflector. It caught me and hurled me back as though it were a tennis player and I the ball. If on returning I should reach the identical spot on the revolving mirror from which I had departed, they would know that I was instantaneous.

"On the other hand, if I did not come back to that identical spot, they could conclude that it took me some time to make the trip—the time represented by the interval required for the revovlving mirror to move the distance between the spot of my departure and that of my return. They found, by noting the direction I was hurled after returning, that the mirror had turned 2¼ degrees between my going and coming, amounted to 1/40000th of a second. I had traveled 4½ miles in that time. So they knew that my velocity is 186,330 miles per second—seven times around the world before you can say 'Jack Robinson'! Thus was Roemer's deduction conclusively sustained.

"Then other men invented a wonderful instrument called the spectroscope which forces me to write my life story on a photographic plate. By this means they can tell whether I originated in an incandescent gas or from a solid body; whether or not I came through a cool gas in leaving the star that started me; and, if, so, whether that gas was under pressure or free.

"Now every message I bring, whether from the nearest planet, the farthest star, or the remotest nebula, can be decoded and read.

"In the words of Abbot, the message may be faint and hard to read, but it tells of the materials of which the stars are made, their temperature, their velocity, their brightness, their distance, etc.

A Wireless Wave Witness.—The last witness to the credibility of the astronomer is the electromagnetic wave. It deposes as follows:

"Yes, I take my hat off to these astronomers. After that canny Roemer proved that light is not instantaneous, another eminent scientist undertook to find out what it really consists of. By purely mathematical processes, this Mr. Clerk-Maxwell came to the conclusion that light is a matter of waves, some of them inappreciably short and others tremendously long; many too short to be seen and some too long.

"I knew he was getting close to my secret, for I am a long wave, sometimes often less than the billionth of an inch in length. Then came another man, Hertz by name. He placed a great sheet of metal against the wall of a room and sent me toward it. I was reflected like sound by a sounding-board. There were two points in the room where the spark would not jump the gap. They were half a wavelength distant from one another. He was thus not only able to detect me, but to measure my length and my velocity.

"Then Branley found how to make an extremely sensitive detector which would catch me. Sir Oliver Lodge developed this into a coherer and employed it in signaling. Wireless telegraphy followed apace, and every boy who has a wireless set uses me because these astronomers, mathematicians, and physicists calculated, detected, and harnessed me."

Thus endeth the testimony, which could be added to, corroborated, and reinforced a thousandfold.

A Penerating Eye.—A visit to an astro-

nomical observatory and a study there of two or three of the instruments with which the astronomer works gives some clue to the secret of the vastness of his power, as compared with the layman's, in penetrating the mysteries of space.

Of course, the first thing that claims our attention is the big equatorial telescope, which multiplies the power of the astronomer's eye as much, perhaps, as a locomotive throttle multiplies the power of an engineer's arm. It is a far cry from the lens fashioned from a block of ice, with which Metius concentrated the rays of the sun and set fire to a piece of wood, to the great 100-inch reflecting mirror of the new Mount Wilson telescope.

The pupil of the human eye is about one-fifth of an inch in diameter. It brings to a focus on the retina only so many rays of light as fall within such an area. If it were one inch in diameter and could bring to a focus all the rays entering it, our vision would be twenty-five times as strong; if six inches, and the rays entering could be centered on the retina, we could see an object nine hundred times as faint as those visible with the unaided eye.

We cannot regulate the size of the pupils of our eyes at will, but we can build an artificial pupil that serves the same purpose. Men call such artificial pupils telescopes. Imagine trying to fill a narrow-necked bottle by catching rain-drops as they fall. Rain falls all around but only a few drops go into the bottle. Put a wide-mouthed funnel into the neck of the bottle and see how much more water you can catch. The telescope is merely a light funnel, wide-mouthed enough to catch many rays of light and to bring them so close together that they can all enter the pupil of the human eye.

Many of these huge instruments have tubes of greater diameter and length than the dimensions of the most powerful gun ever built. They have grown larger and stronger in a way that is startling. In 1861 the 18-inch Dearborn telescope was the biggest in existence. It was when adjusting that instrument that Alvan G. Clark discovered the elusive companion of gay Sirius.

The Big Yerkes Instrument.—Typical of the big refracting telescopes is the 40-inch equatorial at the Yerkes Observatory. The outstanding impression one gets when studying the surpassing delicacy of its mechanical manipulation is that our knowledge of the infinitely large comes from our mastery of the infinitely small.

The big lens of this instrument weighs a thousand pounds and is carried in the upper end of the six-ton, 62-foot tube, which is 52 inches in diameter at the center. To train this big spyglass on a star and keep it there requires that it be mounted on two bearings, one at right angles to the other.

To understand the function of these two bearings, imagine yourself on a merry-go-round, looking through a spyglass at a house away off in the distance. In order to keep the house in the field of vision, you would have to move the big end of the glass backward as you traveled forward. The earth is the merry-go-round and the star is the house in the distance.

So there has to be one bearing that will permit the line of vision in the telescope to move backward just as fast as the earth moves forward. Our terrestrial merry-go-round is rotating at the rate of about 1,040 miles an hour at the Equator, but the sun and the stars are so distant that we seem to pass them very slowly, though their speed as well as their brightness is magnified in the telescope.

To keep the telescope moving backward as the earth flies forward is at once a very big and extremely delicate task. Imagine swinging a huge instrument 64 feet long and weighing, with its movable parts, 22 tons through the air with such nicety of poise that the spider thread in the eye-piece, which is 1/6000 of an inch in diameter, is kept constantly cutting in two a star image that is 1/2500 inch in diameter.

Yet that is what is done at the Yerkes Observatory with the big telesccpe. In the case of the Mount Wilson 100-inch reflector, the parts to be moved weight 100 tons. In all the instruments the movement is made by a huge clockwork that carries the big barrel as steadily as ever an hour-hand of a full-jeweled watch was driven by its mechanism.

"Shooting" the Stars.—But if we imgine ourselves in the merry-go-round and looking at the house in the distance through a spyglass, we not only have to turn it backward as we move forward in order to keep the house in view, but we cannot see it at all if the glass be pointed too high or too low. However, when we get our spyglass at the proper elevation we do not have to raise or lower it thereafter.

So also with the big telescope. The astronomer has to put it in the nightly path of the star across the sky before he can follow it in its journey. To do this requires a second bearing, or axle.

The observer consults his star tables to see exactly how far above the Pole the star's path is. He then moves the lever of an electric motor, and the great tube begins to rise until it is trained on that path. A big graduated circle distinctly marked

and numbered, tells the approximate position. For the exact position, it is adjusted with a slow motion, the adjustment being determined by a very fine circle, the marks on which are read through microscopes.

The astronomer now consults his star tables again and finds the star's position in its apparent nightly path at that moment. He pulls a switch, and the big instrument sweeps along the star's well-beaten track until its approximate position is reached. The slow motion is brought into play, and the big barrel swings directly on the star, which the clockwork, in turn, causes the telescope to follow as it journeys across the heavens.

Suppose that with your merry-go-round spyglass you should have two spider threads crossing one another at right angles, and that the house you were looking at was a mile away; and then suppose that the glass was so powerful that you could see the head of a nail at that distance; and then further suppose that you kept the intersection of the two spider threads trained on that nail-head. Then you have a fair measure of the delicacy of the adjustments of the Naval Observatory, Yerkes, and Mount Wilson telescopes.

Formerly the floor of the observatory was stationary, on a level so low that when the instrument was pointed at the zenith a man sitting in an ordinary chair could look into the eyepiece; but when looking at a star nearer the horizon the observer had to climb up a glorified stepladder twenty or thirty feet high and observe his star from such an unstable perch.

Now, however, the floors of modern observatories can be raised and lowered like an elevator. The domes are made to revolve, so as to bring the shutter-opening over the object end of the telescope.

Taking Pictures of Distant Worlds.—Many of the star observations are not made with the eye. A majority of them are made with a photographic attachment. Often a photographic plate on the big telescope will record in minutes what would require days to work out with eye observations. At the Mount Wilson Observatory some photographs are taken that have to be exposed for four nights.

Think of the wonderful perfection of a driving clock that makes possible four all-night exposures of a given group of stars, no adjustment being required for speed, but the photographer having to keep a constant watch for such changes as the quality of the air, so as to adjust the instrument to meet them!

Powerful as the big telescopes are, they have their limitations. An instrument that magnifies six thousand diameters might be employed, theoretically, in low-altitude work. Such a telescope would bring the moon to a distance of only forty miles.

Atmosphere Limits the Telescope.—But the power that would bring the moon so close, except on high mountains, would also magnify greatly the tendency of the air to obstruct our sight; and, as the late Dr. Simon Newcomb once said, the moon might be brought that close, but our view of it would be as though we were looking at it through a tiny pinhole and several yards of running water. Under such a view the whole atmopshere would look like the air over a hot automobile engine or above a stove—full of heat waves. It is those waves that cause the fixed stars to twinkle.

The observatories on mountains and high plains get rid of so many atmospheric difficulties that it is possible to magnify one hundred diameters for each inch of diameter of the mirrors. The big 100-inch reflector on Mount Wilson therefore has a magnifying power of ten thousand diameters. In other words, an object two miles distant would appear as big as if it were only 12½ inches in front of the unaided eye. The big mirror will gather in a quarter of a million times as many rays as the pupil of the eye receives unaided.

But next to the big equatorial telescope in an observatory the spectroscope claims chief interest. A wonderfully versatile instrument it is in applying the third degree to light. Light is composed of waves of an infinite variety of lengths. The shortest wave-length the eye can see is 1/70000 of an inch long and the longest is 1/40000; yet the Annapolis Wireless Station makes use of wireless waves more than ten miles long, and the Bureau of Standards employs X-rays a billionth of an inch short.

The spectroscope takes the visible rays and their closest neighbors above and below—the ultra-violet and the infra-red—tears them into shreds and assorts them according to their wave-lengths with as much certainty as a banker assorts the different denominations of his money.

It not only analyzes the light that comes from the sun and the stars, but lights that come from all the earthly elements. It tells with equal fidelity whether a red particle is dried blood or colored paste, or whether a ray of light came from iron or from soda. It once revealed new lines in an European mineral water. Forty tons of the water had to be evaporated to get two teaspoonfuls of the element, but the spectroscope had detected its presence.

In our childhood days we all recited the

stanza, "Twinkle, twinkle, little star"; but we no longer need to "wonder what you are"; for now, as one authority tells us, "Unto the midnight sky we the spectroscope apply."

A photograph of the sun through some of the more powerful spectroscopes shows several million of the telltale lines. Sodium has only two, calcium has seventy-five, and iron has more than two thousand. Thirty-nine of the common elements in the earth show lines that have perfect matches in position, arrangement, and character in the sun.

How Light Is Torn Apart.—There are three classes of spectroscopes: In the one type the light is broken up by being passed through prisms; in the second class the light ray is torn apart by the lines of a diffraction grating through the same process that gives the opal its color; in the third kind the light is separated by being passed through a "stairsteps" of optical glass.

The telescope has proved that the same laws of mathematics and mechanics that govern the fall of an apple, the dropping of a tear, or the rise of steam from a teakettle apply as well to the sun of the day and to the stars of the night. But the spectroscope proves that the chemistry of coal-stove and test-tube is also the chemistry of sun and star. With it man went 93,000,000 miles away to find the helium that is in the very air we breathe and that soon will give buoyancy to the dirigible airships of our navy.

Fiery Flames Leaping Into Space.—It is thirty years since solar prominences, those fiery flames that shoot out from the sun to distances greater than that from the earth to the moon, were first discovered. Formerly they could be observed only during the few minutes of total eclipses of the sun, and it was possible to study them for only fifteen minutes in a quarter of a century. Then Professor Huggins found that by screening off the disk of the sun and widening the slit of the spectroscope we may see these prominences at any time.

With the spectroheliograph it is possible to get pictures of the sun and these prominences in the light of a single substance, so that the astronomer is now able to study them any bright day. Think of explosions so powerful that they hurl material three hundred thousand miles into space with a velocity of two hundred miles a second!

Not only does the spectroscope tell us of the material of which the sun and the stars are composed, but it also tells us whether a star is headed toward us or away from us, is coming or going, and how fast.

Did you ever notice, in traveling, when meeting a train on a double-tracked railroad, how much higher the pitch of the bell is as it comes toward you than when going from you? More sound-waves reach your ears as the train comes toward you than as it goes from you. The same is true with the light-waves in the spectroscope. If the star is coming toward us, the lines shift toward the violet or higher pitch; if receding, toward the red. And these shifts are always proportional to the speed of the star; so that not only the coming and the going are recorded, but the velocity as well.

The Patience of Astronomers.—The patience with which astronomers make their studies in their unrelenting pursuit after truth is unsurpassed in any field of human inquiry. At the Naval Observatory in Washington computations based on a single series of observations have been in progress for a period of nineteen years, but are not yet completed. The results of the various expeditions that observed one of the transits of Venus were for half a century under calculations and comparison.

A single investigation of the inequalities of the changes of the moon required 9,000 hours of hard calculations by a trained mathematician. There were 13,000 multiplications of series, containing some 400,000 separate products. The whole computation required the writing of nearly five million digits and plus and minus signs. And even then the author felt that much remained to be done before he could construct the tables he had undertaken to make.

Our Stupendous Insignificance.—Before starting out to explore the heavens and to make a biographical survey of its more prominent folk, one here might well revert to that old, old question: "What is the good of it all?" Are the fruits of astronomy worth all the labor and thought expended on it? The thoughtful man realizing how vastly it enlarges his appreciation of the great First Cause, how wonderfully it teaches us the stupendous smallness of our place in the universe, finds it both good and profitable.

But even to the man who looks for direct physical benefits and every-day good, its worth will appear. Parallels of latitude and meridians of longitude depend upon it, time signals are born of it, safe navigation at sea were impossible without it. State and national boundaries are often fixed by it.

Yet the indirect benefits excel, if that

may be, the direct ones. When Roemer discovered the velocity of light, little did he suppose that the interpretation of his discovery would lead to wireless communication.

It is interesting to have a look at our own earth in its relation to the worlds that people the sky. When a mighty storm sweeps over the ocean, when a great war devastates a continent, when a Katmai blows off her head, when an earthquake destroys a populous city, men stand overwhelmed and awed at the spectacle!

But how little and insignificant are such forces, measured by the majestic might of the earth as it sweeps on its course around the sun!

An eminent physicist has estimated that the power developed by a million Niagaras in a million years would not equal the energy experienced by the earth in a single second as it circles round the sun.

And yet so perfect is the mechanism that, flying around its axis at an equatorial speed of more than a thousand miles an hour, and around its orbit at more than eleven hundred miles a minute, all the mundane influences of which astronomers know could not change the length of its day as much as a second in a hundred thousand years.

Where the Earth Becomes a Drop in a Reservoir.—But as soon as one looks out into space with the eye of the astronomer, there comes the discovery that in all its seeming greatness the earth is so small that even a telescope ten thousand times as powerful as the strongest instrument now in existence would not reveal it to an astronomer on any fixed star.

Compared even with the sun, our planet's insignificance becomes evident. More than 1,300,000 spheres like ours would be needed to make a bulk equal to that of a single sun.

Perhaps our most graphic picture of the solar system is given by Herschel. Imagine a circular field two and a half miles in diameter; place a library globe two feet in diameter in the very center; eighty-two feet away put a mustard seed. The globe will represent the sun and the mustard seed Mercury.

At a distance of 142 feet place a pea, and another at 215 feet. These will represent Venus and the earth, both as to size and distance. A rather large pinhead at a distance of 327 feet will speak for Mars. and a fair-sized tangerine a quarter of a mile distant will stand for Jupiter. A small lemon at two-fifths of a mile will play the rôle of Saturn, a large cherry three-fourths of a mile will answer for Uranus, and a fair-sized plum at the very edge of the field will proclaim Neptune.

Sight-seeing the Solar System.—In our celestial tour there is time for only a passing reference to the moon and the planets. Eighty moons would be required to make one earth. A player there could throw a ball six times as far as it can be thrown on American diamonds. A man weighing 150 pounds there would weigh 900 on the earth. The earth receives as much light and heat from the sun in thirteen seconds as it gets from the moon in a whole year.

Mercury is almost the "unseen planet." Being very close to the sun, it is nearly always engulfed in the rays of the dawn or overwhelmed in the haze of twilight, and thus rarely gets a chance to shine out. At some stages of its journeyings Mercury almost breaks the solar system's speed limit, dashing wildly along at a pace of more than two thousand miles a minute.

Venus was an unusually interesting object in the sky during July of this year. Not again until February, 1921, will it appear as bright and fair in the evening sky. It has phases like the moon, and these can be seen even through a good field-glass. Its day is believed to be the same length as its year, which is 224 of our days.

Will a Star Foretell Our Weather?—Mars always challenges interest. Its day is about the same length as ours, but its year is nearly twice as long. Although astronomers generally take less interest than laymen in the surmise as to whether other planets and stars are inhabited since they, more than laymen, realize that this is a problem that must in all human probability remain unsolved, the question is more often asked about Mars than any other planet.

It is quite generally believed that Mars his ice-capped poles. The telescope reveals white spots at the poles that have every appearance of being like our ocean Polar region. They advance toward the Equator in winter and retreat in summer. In the summer of 1916 Pickering, who, with Lowell, has led the school of astronomers who believe they can see canals on Mars, said that he found the white caps stretching farther down toward the Equator than he had ever seen them before.

He said that if there was an connection between the weather of Mars and that of the earth, the winter of 1916-17 would be the coldest in many years. And it was. May it yet be possible to do long-range weather forecasting on the earth by studying the waxing and waning of the ice-cap on the South Pole of Mars?

Swinging around the sun at a distance

five times as remote as that which separates the earth from the source of its light, having a year nearly twelve times as long as ours and a day less than half as long, Jupiter is as much bigger than the earth as a tangerine is larger than a pea. He has nine satellites, seven of them revolving around him in one direction, the other two pursuing an opposite course. Saturn, with its wonderful rings, is one of the finest objects in all the skies through a telescope of even moderate size. Uranus is barely visible to the naked eye, while Neptune can be seen only with a telescope.

Whether studied as the head of the planetary family to which the earth belongs, or whether as an average member of the great household of suns that dwell in the distant skies, Old Sol has many thrills for the student.

To the inhabitants of the earth the fact that he shines is the most important physical consideration in life. From him we derive warmth, light, and power; without him the oceans and even the air itself would freeze; and, of course, under such conditions, life would be impossible.

Ties that Bind.—With what firm ties he holds his family together well-nigh defies the imagination.

Prof. Charles G. Abbot estimates that a steel column five hundred miles thick would be required to keep Neptune in its path around the sun if the force of gravity were removed. Sir Oliver Lodge has estimated that the pull between the components of the double star Beta Aurigæ is twenty million times as great as the force that keeps the earth in its path.

Prof. F. R. Moulton says that the heat that reaches us from the sun amounts to more than two trillion horsepower, in spite of the fact that two billion horsepower goes off into space for every single horsepower that comes to the earth itself.

While the stars appear to us about as much like the sun as the fireflies of a summer night, yet the patient investigations of astronomers show not only that the sun is a star, but that it is by no means either the largest or the brightest of the celestial family.

Assured that it is a star and knowing that the next nearest one is three hundred thousand times as far away, astronomers addressed themselves to the task of learning about the other stars by studying our own. They found that there are some like it, giving out the same kind of light, though most of them send us, through the spectroscope, messages that tell quite different stories.

With the fundamental facts about the sun in hand, most astronomers are now engaged on star studies. A photographic chart of the whole sky is being prepared by the observatories of the world. This chart requires the taking of 22,000 photographs, each covering four square degrees of sky.

Mapping a Universe.—Each photograph has in it several stars whose positions have been fixed by direct observation. From them the position of every other star shown on the plate can be fixed by measuring, with a machine employing high-power microscopes, their exact places in the photograph. The completion of this work will record the position of at least eight million stars.

When we consider the solar system—with its great sun, its eight planets and their twenty-seven moons, and its eight hundred asteroids—as occupying an area whose diameter is nearly six billion miles (some six million times as far as from New York to Chicago), it is amazing to think that there may be millions of other solar systems as large or larger than our own, comparatively close to us as star distances go, though so remote that their planets could not be seen by the astronomers of the earth, even with telescopes as much more powerful than the biggest ones now in use are stronger than the naked eye.

The Acme of Isolation.—So careful an astronomer as Agnes M. Clerke tells us that a skiff in a vast, unfurrowed ocean could not be more utterly alone than is our solar system in its little corner of the universe. She continues:

"Yet the sun is no isolated body. To each individual of the unnumbered stars strewing the firmament, down to the faintest speck of light, . . . it stands in some kind of relationship. Together they master its destiny and control its movements. Independent so far as its domestic affairs are concerned, it is bound up, as a star, to the other stars by influences reaching across the unimaginable void that separates them."

A Terrifying Pace.—Spectroscopic studies and sky observation alike tell us that our sun and his family are all headed in a great migration across the sky toward a point between the constellations of Hercules and Lyra.

The speed with which we are traveling in that direction is twelve miles a second. The velocity of an artillery shell is around 3,000 feet a second; that of the sun 63,000 feet. An artillery shell with the velocity of the solar system through space would, according to Kippax, penetrate a sheet of steel four city blocks thick.

Think how far we travel every year and how complex our journey! In the first

place, those of us who live near the Equator cover upward of nine million miles in our flight around the earth's axis. In the second place, in our journey around the sun we travel nearly six hundred million miles. While we are doing all this we are also being carried off into new and untried regions of space at the rate of four hundred million miles a year.

Is our great family journey through space along a straight road, or is it revolving around some greater body, even as the earth revolves around the sun and the moon around the earth? The astronomer tells us frankly that if the sun has an orbit its curve as yet defies detection.

Referring to the picture of the heavens on page 171, and to the map accompanying it, let us survey the sky as it will appear at the hours and on the dates given herewith.

Of course, the Great Dipper will first claim our attention, as it is the principal "landmark" of the heavens. It will be seen westward from the Pole Star, with its Pointers guiding the eye to Polaris and its handle sweeping in a broad curve toward Arcturus and Spica.

The Great Dipper.—The star at the bend of the handle of the Great Dipper is known as Mizar. Insignificant though it looks in its smallness, it radiates more than a hundred times as much light as the sun, and is nearly five million times as far away. Its light has to travel three-quarters of a century to reach the earth. It is a great triple luminary. The combined mass of two of its members is many times as great as that of our sun; they swing around their common center of gravity every twenty days.

Following the line of the Pointers eastward, one's eye picks up Polaris, the only bright star in its neighborhood.

Shining down upon us from a point almost midway between the zenith and the northern horizon in the latitude of Washington, this humble star of the second magnitude tells little of its glory. Yet it is so distant that the light-waves entering the eye as one looks at it to-day left it forty-five years ago and have been traveling at the rate of more than eleven million miles a minute to reach us.

Not one star, indeed, but three—a triple sun—is Polaris. Until recently it was supposed to be a double star, but the newer high-power telescopes reveal that the brighter of the two companions has a closer companion of its own.

Vega And Its Companion.—In the zenith is Vega, the bluish-white star of the first magnitude that shines down with beautiful brilliancy from the constellation Lyra, the Harp. Any doubt in identifying Vega, otherwise Alpha Lyræ, can be dispelled by observing the close equilateral triangle formed by it and its companions, Epsilon and Zeta Lyræ, this being the only triangle of its kind in the whole heavens.

If with the unaided eye we viewed the sun from the distance of Vega, it would appear as one of the dimmed stars. Vega is said to be eight million times as far from us as we are from the sun.

Epsilon Lyræ is a double star. Neither Persian, Arab, Greek, nor indeed, any primitive people, seems to have discovered that fact, though with good eyes it can be seen as such on a clear night. May not this indicate that the eyesight of the human race is improving. With a telescope we can see that each part of this double star is itself a double—in other words, that Epsilon Lyræ is indeed a magnificent system of four suns.

Light that Must Travel Five Thousand Years to Reach Us.—A little past the zenith is the constellation Hercules. It isn't a particularly bright group, not a single star in it being brighter than the third magnitude; but it has an easily found trapezoidal figure of five stars the base turned toward the north. On the west side of this trapezoid, about one-third of the distance from the base, is what appears to be a faint and fuzzy little spot, visible only on the clearest nights; but train a high-power telescope on it and you will see one of the finest star-clusters in all the heavens.

Ritchey's photograph of this cluster, taken with the big 60-inch Mount Wilson reflection, discloses that it is made up of more than fifty thousand stars, very many of them as big and as bright as our own sun. Photographing the cluster first with plates sensitive to blue light and then with others sensitive to red indicates that they are giant red-and-yellow worlds like Arcturus and Antares.

How far away they are cannot be said, for they are too remote for measurement with the finest instrument yet devised. It is certain, however, that they are at least so distant that the light coming to the earth from them this year may have started on its hurtling journey through space about the time of Joshua's conquest of Jericho.

In other words, if a space-penetrating eye on one of the stars of this Hercules cluster could be looking down on the earth to-day it might be watching the armies of the Lord encircling the doomed city.

Suns that Put Ours to Shame.—To the west of Hercules, easily located by continuing the curve of the handle of the Great Dipper for a distance approximately equal to that which separates Polaris from

the nearest Pointer, is Arcturus, king bee of the constellation Boötes, the Hunter.

Of a deep orange color and of the first order of brightness, Arcturus is a sun that makes our own pale in comparison as a tallow dip pales before an arc lamp. Indeed, it is thought to radiate five hundred times as much light as our sun.

Away down toward the southwestern horizon, as viewed from Washington, is Antares, two hours past the meridian. The starry heart of the Scorpion, this blazing sun is fiery red in hue and gives off two hundred times as much light as the orb of our day.

Altair, the bright star of the constellation Aquila, the Eagle, forms the head of a great cross, of which the Pole Star is the foot and Vega and Deneb the two arms. Far brighter and bigger than our sun, Altair is rushing toward us at the rate of eight hundred million miles a year.

The Letter Written in the Heavens.—About as far east of the meridian as Hercules is west is the constellation Cygnus, the Swan, with Deneb as its principal star. Deneb is so far away that the light rays entering our eyes from it this year left it during the reign of Queen Elizabeth. It is driving through space toward us at the rate of nearly two thousand miles a minute, spectroscopic advices say.

Eastward from the Pole—about as far from Polaris as the latter is above the northern horizon—is Cassiopeia, the Woman in the Chair. The major stars of this constellation form a letter "W." The star at the middle of the third stroke is a double, its two members revolving around a common center of gravity in a period of about two hundred years. If either of them has a family of planets, their system of day and night, as well as their seasons, must be powerfully complicated.

Well down toward the eastern horizon is the constellation Andromeda, the Chained Woman. It contains no first-magnitude stars, but has a line of stars of the second magnitude extending from the northeast to the southwest, by which it can be located. About fifteen degrees directly south of the brightest star of the group is a little patch of light that can barely be seen. Whether this is a nebula, or whether another universe so immeasurably distant that its light is only a haze, has not been determined. The spectroscope seems to translate its light message as saying that it is composed of solid or liquid material surrounded by cooler gases.

Down on the northeastern horizon is the constellation Perseus, the Champion. Its brightest star is the center of a twinkling field regarded by many as the finest spectacle in the heavens when viewed through field-glasses. Its second star has been called Algol, the Demon. It varies in magnitude, losing two-thirds of its light between its brightest moments and its darkest, which follow one another every sixty-odd hours.

One might pass by Pegasus the Winged Horse, with its famous square, in the southeastern heavens; Delphinus, the Dolphin, with its closely grouped stars, lying between Pegasus and Aquila; but away down on the southern horizon, on the very meridian, is a constellation, Sagittarius, the Archer, which rivets the beholder's attention. It lies in a region full of star-clusters and nebulæ of great beauty.

With the exception of a few minor constellations, this completes the list of the principal people of the sky visible at the hour named. But those who will take the trouble to watch as the months go by will see many others of rare beauty and striking appearance.

Aldebaran, a star that is well past middle age, as disclosed by its color, and yet driving toward us at the heart-breaking speed of two thousand miles a minute; Capella, so distant that our sun could barely be seen by us if as remote, but so bright that it outshines our sun as a candle outshines a fire-fly; Rigel, so hot that it would roast us alive if it were to come as close to us as the sun; Betelguese, Sirius, Procyon, Castor and Pollux, Regulus, Spica and Fomalhaut—all these are in the heavens of the daytime in late August and therefore not visible at night.

But next March they will be in their glory in the night sky, vying in beauty with the Milky Way. To know them is to add new joy to a walk in the open air on a clear winter's night.

One fain would pass on to ten thousand others of the hosts of heaven and to the wonderful stories they can tell. The variable stars, like Algol, in which the brighter member of a double star is eclipsed by a darker one at regular periods, are hard to pass by.

The "Speed Merchants" of the Heavens.—So, also, are the "runaway stars" that are speeding through space at gaits that astound the astronomer. In the southern heavens is a runaway called "243 in the fifth hour of right ascension, in the Cordoba Zone Catalogue." It is traveling 170 miles a second—eight times as fast as the average star. No. 1830, Groombridge, in the Great Bear, has a velocity of perhaps 200 miles a second. At that rate it could fly around the earth in a shade more than two minutes.

Either the universe is vastly more ex-

tensive than the most advanced astronomer dares thing or else these stars will run clear through it and out into God only knows where, unless they shall sooner pass close enough to some bigger star that can tame them.

The Milky Way.—Called the Silver River of Heaven by the Japanese, pronounced by the ancient mythologists the dust stirred up by Perseus as he hastened to the rescue of Andromeda, the Milky Way sweeps in a vast circle around the celestial sphere. Herschel said it might be likened to a great grindstone. It is made up of millions of small stars that cannot be separated without optical aid.

This great star stream, coursing its way around the heavens, in a sweep that may require as much as two hundred million years for its circuit, seems to have captured the vast majority of the folk of the universe, and is flowing in unending procession onward and onward. Here it branches and flows around an island of blackness; at another place it is narrow, as though passing through a gorge; and elsewhere it widens out as though flowing through an alluvial valley.

Composed of great clusters of multitudinous suns, many of the individual members vastly larger than our own, one who looks upon the Milky Way can feel, with Buchanan Read, that the stars that are faintest to us may to diviner vision be the noblest of them all.

Nor is it easy to neglect those wonderful objects of the sky, the nebulæ, those wonderful aggregations of gas or microscopic dust. Look on a winter's night at Orion. Between Betelguese and Rigel is his belt, and suspended from this belt his sword. The central star of this sword appears to the naked eye as merely a fuzzy little fellow that might be passed over without thought.

The Inutterable Greatness of the Nebulæ.—But train a big telescope on it and instead you see the most magnificent nebula in the heavens. Its diameter is thought to be twenty million times as great as that of our sun. Even in its density were as much more attenuated than air, as air is lighter than lead, it would still be, according to figures suggested by Professor Moulton, as much heavier than the sun as the great Pyramid of Cheops is heavier than one-tenth of an avoirdupois grain.

Of such attenuated material as this are worlds called into being under laws made in the beginning. How many worlds have met, and are meeting, the description, "the earth was without form and void"! And from such new-born worlds with their blazing white light, of which Rigel is a type, down through the bluish white of which Sirius is a representative, and then through the yellow, like our sun and Procyon and Arcturus, to the red ones, like 19 Piscum, and again to those that are black and eclipse their brighter neighbors in the variable stars, we run the gamut of star life, with here mewling infancy, there gay youth, elsewhere sturdy manhood and ripe age. And in the end come dead suns, derelicts in the ocean of space.

When the sweet singer of Israel sang that "the heavens declare the glory of God and the firmament sheweth His handiwork," he had never seen more than five thousand stars. With the latest Mount Wilson reflector three hundred million will write themselves upon the photographic plate.

In David's Time and Ours.—What in David's time and with the naked eye were only gems to render a sky more beautiful and wondrous for mundane dwellers, are revealed, through such powerful instruments, as worlds and systems, immeasurably distant the one from the other, but each and all actuated by laws so all-pervading that they apply alike to infinitesimal and to infinite, so enduring that they survive all wreck and change, so powerful that all things created are controlled by them, and yet simple enough that with patient endeavor the astronomer and the chemist and the physicist are learning their principles one by one.

GENERAL INFORMATION.

BY ABBY A. SUTHERLAND.

THERE are sentimental pessimists disguised as optimists who sometimes insinuate that general information belongs to other ages than the present. The old idea of an educated man or woman, one who knows something about everything and everything about something, is giving place to the specialist idea. Jacks-of-all-trades in the world of thought are not needed in our age of efficiency. One almost apologizes for information in any field outside his own realm of thought lest he be surrounded by the dingy specialists of that field.

The daily examination of life in general information is easily shunted. The self-complacent find easy escape from the results of lack of information. The joke about the sneezy sounds of Galician names avoids the issue, namely, whereabout on the map is this *terra incognita* Galicia? Is it relegated to that limbo of vagueness,

"the great East"? Is it a Baltic State? This need not be revealed. The substitute for definite information geographic is some irrelevant side issue of vague nationalities, of lost causes and so on.

The worth of our own equipment in this line is known to each of us. In the nebular haze where our intellectual conscience should preside we hold court and try the culprit or we don't. With the schoolmaster's "thou must" no longer near, the truant too often escapes. The test of the pessimist charge is easy to any who are fair-minded. Locate a half dozen places definitely, as if under examination, and see how accurate and definite is our information: Cyprus, Stamboul, Bombay, Quito, Caracas, Tibet, Cettinje, Palermo.

The deluge of modern reading seems to be depriving the world of its accuracy. Definiteness and exactness of knowledge are its most satisfying qualities. These tend to correlate the newly acquired knowledge with the old. Instead of a large, weltering, inchoate mass of uncertain data, a few minutes of accurate self-searching each day would insure a usable mass of known material.

In a general information test recently given to a group of fifty men and fifty women (professional and business men, and women of good average intelligence the average of the men's papers was 84, the average of the women's was 77. The test was on general, not obscure information in geography, history, art, literature, present events, science, etc. All agreed that the questions were fair and such as all should have known.

The result was somewhat surprising. The inference seems to be that men acquire and keep on hand the general broad lines of information better than women. The clubs for study, the current event classes, the large amount of current literature reading, all would seem to warrant us in believing that women give more time to general improvement and reading than men do. One reason they do not retain it as well seems to be that they overdo the process. Close, concentrated reading of a daily newspaper and few periodicals seems to equip the mind better than too much reading. There is a plethora of taking-in, there is an indigestion of the reading faculty, a chronic sickness of following the printed page.

A little reading well correlated and digested, well assimilated, with the ruminating process of slow consideration, seems to be the passport to that goal of all our desires, a well-informed mind.

The men of a few books have been masters of style because they knew those books. The readers of a few good sheets, with deliberate and leisurely reflections, are masters of general information.

"I WISH I HAD A MILLION."

SO spoke one day a young man whose feet had just fallen upon the threshold of life's sterner activities.

"What would you do if you had your million?" asked his companion.

"Well," said the covetous and impatient young man, "the first thing I'd do would be to quit work. I'd resign my position right away. Then I'd have a good time. I'd have a fine house with beautiful grounds, a fine library and paintings, and all that; and I'd have horses and an automobile and a steam yacht, and I'd travel and see the world. O, I'd have a glorious time of it, and be happy!"

"No, you wouldn't," said the other. "You would be a miserable man from the beginning if you tried to carry out that programme. The man who quits work soon becomes lazy, and a lazy man can manufacture more misery in one day for himself and for every one about him than a hard-working man can turn into happiness in a week."

It is not every man or woman that can find supreme contentment in work. Indeed, contentment lies not in the work so much as in the motive back of it. If one can see the labor of his hands "established," to use a Scripture phrase, there is sure to be an exquisite degree of satisfaction; but work becomes mere drudgery when the worker is not permitted to enjoy some measure of its reward.

However, there are many rich rewards of work that the toiler does not usually dream of. Charles Kingsley says: "Thank God every morning when you get up that you have something to do which must be done whether you like it or not. Being forced to work and forced to do your best will develop in you temperance, self-control, diligence, strength of will, contentment and a hundred other virtues of which the idle never have any conception." This being so, it is of infinitely greater concern and profit to a man that he should be under the sway of these essential virtues than that he be possessed of a million. For with the possession of these qualities and the wise use of opportunities he may be enabled to secure his million; while, having his million and not the virtues which give dignity, poise,

breadth and strength to character, and therefore nobility, beauty and usefulness to life, it is impossible for him to escape the "broad way that leads to destruction." This, alas, many have found to their sorrow and shame.—*Christian Advocate.*

STATE WILL COVER DEFICITS.

THE Woodruff teachers' salary measure, which created much discussion during the 1919 session of the Legislature, after becoming a law meant that upward of $6,000,000 had to be provided by the state during the last school year to meet increases in salaries. The last Legislature appropriated $10,500,000 for the two school years ending next June 30, so that the 1921 session of the Legislature will have to provide for a deficiency of approximately $1,500,000.

The state fiscal officers are now paying the school districts their share of the state fund for the school year ending last June 30 on vouchers from the State Department of Public Instruction. The estimates show that $5,931,314.84 will be required to meet the state's share of the enlarged teachers' salaries.

The Woodruff law provides for increases of 25 per cent. for all teachers who received less than $100 a month, 20 per cent. for those receiving between $100 and $150, 15 per cent. for those receiving between $150 and $200 and 10 per cent. for those receiving more than $200 a month at the time of the enactment of the measure. Under this law the state is pledged to pay the districts for each teacher holding permanent or college certificates $20 a month toward the increased pay; for teachers holding professional or normal school certificates $5 a month, with an extra $5 a month for teachers in rural schools with provisional certificates and $10 a month if the teachers hold certificates of a higher grade. The minimum salaries were increased from $45 to $60 for holders of provisional certificates, from $55 to $70 for holders of professional and normal school certificates and from $65 to $80 for teachers holding permanent or college certificates.

Under the minimum salary act of 1906 the state made up to the school districts the difference between salaries then paid and the amount that would bring them within the minimum salaries at that time of $45, $55 and $65. Districts then paying fair salaries received little reimbursement from the state, but others whose salary schedule was low received a generous income from the state treasury, the total sum reaching $2,201,115.35 annually. Under the Woodruff act Potter county is the only county which received less from the state than under the old minimum salary law, but there are many smaller counties whose districts must bear practically all of the burden of the 25 per cent. increase.

The amount received by each county under the old and under the new salary laws are as follows:

	Minimum Salary.	Teachers' Salary.
Adams	$21,064.00	$25,212.50
Allegheny	44,919.70	722,234.72
Armstrong	37,677.50	55,389.50
Beaver	25,066.00	82,680.00
Bedford	32,608.73	34,807.50
Berks	103,644.50	170,450.00
Blair	31,789.50	89,280.00
Bradford	44,355.88	58,247.50
*Bucks	35,123.50	69,732.52
Butler	20,677.50	56,195.00
*Cambria	32,615.50	133,764.50
Cameron	5,100.00	6,884.50
Carbon	25,795.00	47,433.78
Centre	28,901.00	37,650.00
Chester	56,560.75	110,481.36
Clarion	27,442.25	32,815.00
*Clearfield	45,674.00	70,932.00
Clinton	23,798.50	25,610.00
*Columbia	33,655.00	44,457.50
Crawford	48,287.50	66,161.26
Cumberland	33,703.78	50,145.00
Dauphin	44,691.50	117,077.00
*Delaware	36,949.25	125,033.78
Elk	19,483.33	33,078.76
Erie	57,291.50	124,042.52
Fayette	28,958.75	132,355.00
Forest	6,550.00	9,965.00
Franklin	36,509.20	57,765.00
Fulton	7,517.00	7,597.00
Greene	12,883.00	29,492.50
Huntingdon	26,002.50	32,570.00
*Indiana	35,090.87	52,334.00
Jefferson	23,634.50	46,992.50
Juniata	12,584.00	13,400.00
*Lackawanna	71,605.50	258,308.50
Lancaster	56,151.05	125,000.04
Lawrence	22,290.00	66,205.00
Lebanon	35,805.00	55,062.50
Lehigh	41,920.25	114,410.00
*Luzerne	107,341.00	320,166.00
Lycoming	35,704.50	63,960.00
McKean	23,157.50	48,977.50
Mercer	39,154.00	78,492.50
Mifflin	14,643.00	23,872.50
Monroe	17,722.00	22,701.50
*Montgomery	59,981.00	161,385.02
Montour	9,045.00	11,040.00
*Northampton	55,713.25	125,197.20
Northumberland	44,109.50	88,316.50
Perry	21,286.00	23,850.00
Pike	7,765.00	8,015.00
Potter	25,572.00	24,192.50
Philadelphia	.....	684,058.12
*Schuylkill	68,544.25	94,946.26

*Counties not complete, but estimated on teachers' salaries.

Snyder	12,740.00	14,100.00
Somerset	29,586.76	54,307.50
Sullivan	9,465.00	10,015.00
Susquehanna	29,351.00	32,385.00
Tioga	36,156.50	38,774.50
Union	10,919.00	12,835.00
Venango	21,799.00	54,915.00
Warren	31,339.00	47,175.00
*Washington	7,976.00	147,334.50
Wayne	26,167.50	29,172.00
*Westmoreland	41,270.50	194,761.50
Wyoming	13,897.00	15,512.50
York	73,333.00	109,058.12
	$2,201,115.35	$5,931,314.84

Public Ledger.

THE BLESSING OF LAUGHTER.

"Among the countless blessings that mankind is privileged to enjoy not the least is the blessing of laughter," writes William Thomas McElroy, in the *American Messenger*. We do not mean the loud, boisterous laughter of dissipation and evil, nor the careless, thoughtless laughter of vanity, but the whole-souled, hearty laughter of thorough enjoyment and a heart thrilled with love for God and man.

A happy story is told in this connection of two men who were among the best known and most influential men of their age—Rev. Dr. Thomas L. Cuyler, of Brooklyn, and Rev. Dr. Charles H. Spurgeon, of London. It is related that on one occasion, after a period of unusually hard work, they went out into the country together for a holiday. As they roamed the highways and meadows with all the enjoyment that the true lover of nature can find under such conditions, Dr. Cuyler told one of his experiences, at which the famous London preacher laughed heartily. A moment later he turned to Dr. Cuyler. "Theodore," he said, "let us kneel down and thank God for laughter." "And there," says the writer, who relates the incident, "on the green carpet of the grass, under the trees, two of the world's greatest men knelt and thanked the dear Lord for the bright and joyous gift of laughter."

It is not a small gift, this gift of laughter. It is a true proverb that "he who laughs oftenest lives longest." Where true heartfelt laughter is, there can be no evil, no worry, and no wicked thoughts. For in themselves such things destroy the very qualities that tend to lightheartedness. It is impossible to laugh happily with a troubled conscience. And the laughter of the evil-minded is as harsh and as unpleasant as are their scowls and imprecations.

Laughter helps in many ways to make this old world better. It makes us more loving, more charitable towards others more sincere in our efforts to help those who are in need more useful to those who come in contact with us, more ambitious to prove ourselves of value to the world, more helpful, more kind, more healthy, and consequently more efficient, and more thoughtful of the Giver of all good and loving gifts.—*Presbyterian.*

PLANTING SHADE TREES.

THE American States are beginning to give practical encouragement to the planting of shade trees, which minister so importantly to the public comfort and health during our tropical summers, and contribute so much to the beauty of the landscape and the attractiveness of the roadside. During the last year legislation applying to this branch of forestry was enacted by several States.

It is to be hoped that farmers and residents of unincorporated villages will take advantage of the Act passed at the last session of the Pennsylvania Legislature to encourage roadside tree planting, and that the Pennsylvania countryside may thereby in time become as attractive by the abundance of shade as the New England villages are in summer. The act is operative for the remission of a portion of the road taxes in all cases in which the trees have been set out the year previous to the demand for the abatement of the tax, and are living and well protected from domestic animals at the time of such demand. Any one who is liable for road tax who shall transplant to the side of the public highway on his own premises any fruit, shade or forest tree of suitable size shall be allowed by the road supervisors in abatement of his road tax $1 for every two trees set out. Elms shall not be placed nearer than seventy feet; maples and other forest trees fifty feet, except locust and Carolina poplar, which may be set thirty feet apart, and except fruit trees, which may be set forty feet apart.

The roads to which the act applies must run through or adjoin cultivated fields. Trees growing naturally by the side of such roads shall be allowed for at the same rate. But in no case shall an abatement be allowed for tree planting in excess of a fourth part of the annual road tax. Inasmuch as the road tax in many townships is a considerable item, an abatement of a fourth is worth consideration.

It is provided that any person who destroys or injures the trees thus planted, or who carelessly permits a horse driven by

him or for him to injure said trees, shall be subject to a penalty not exceeding $5 for every tree killed or injured. The act is much in advance of any previous Pennsylvania legislation on the subject. It received the approval of those who are interested in forestry. The act requires the township supervisors to keep a permanent record of the trees planted, for which the tax abatement is allowed; but it contains no provision for reporting to a State authority the number of trees planted so that it can be ascertained what progress the State is making in this direction.

EDUCATION, THE CRADLE OF DEMOCRACY.

BY BYRON J. PICKERING.

IT must be acknowledged that the American Public School has accomplished more to break down class distinction, religious intolerance and lay the corner stone of democracy than any other known institution, be it private or public, charitable or mandatory in character. In a country like ours we must have a common experience, the opportunity to get together on the common ground of sympathy with one another, and what can better bring this about than the common school?

What we are as a people educationally is strictly what the secondary school made us, and these schools ought to receive both local and national care. No democracy can be better than its educational system, for democracy is the fruit of education.

The present outlook for efficient schools to meet the needs of our unsettled condition is rather cloudy and very questionable. The professional spirit of teachers seems to be waning under the present financial requirements. Teachers cannot afford to attend special schools or enter evening courses at the University, but instead of using spare time for advancement in scholarship or Methods of Teaching they are obliged to increase their meager income by clerking in merchantable establishments, operating at the telephone, or other employment. There is practically only one class that receives less pay annually than grade teachers, namely, domestics. A track hand working on our local railroads receives $1300 per year. A carpenter is paid at the rate of $2300 per year. Schools are competing with industries, and more attractive conditions must be offered if they would attract capable teachers. Business firms treat employees more humanely than do school boards, and there must be a readjustment of methods to compete with the former.

Dr. John H. Finley, Commissioner of Education of New York, recently proposed the establishment of national training schools—Plattsburg for teachers—offering inducements as generous as those to military officers. We believe this of little avail unless conditions of teaching are made more attractive.

Raising salaries as the economic situation demands, without forcing teachers to press their case, would increase their respect for their work. More humane treatment, smaller classes, greater freedom in planning work, more attractive accommodation, and pay for absence for legitimate reasons, salary payable twelve months the year, would help to offset the broader advantages offered by commercial houses.

Stimulation of interest in the profession through well organized publicity in current periodicals, the advertising of positions of cultural and occupational advancement through teaching, and a general application of business methods through the entire administration would tend to infuse the system with a new life and make it more attractive to beginners.

You cannot become democratic without study, and though you can do many things without an education, you cannot make our city and country a democracy without real education.

WHY I MEMORIZE THE BIBLE.

I AM a busy housekeeper, but every day brings tasks that employ my hands, leaving my mind idle. It is while doing these things that I learn verses from the Bible or review those already learned. The results are surprising, but there is no secret about my success, except that I began and have kept on. Sometimes I am too tired and dull to learn, and then I wait until the next day and try again.

I find that this memorizing is good mental discipline. At first, being long unused to such study, it was difficult for me to learn even one verse correctly, but, with a determination to have every "and" and "the" right, I can now commit to memory accurately and rapidly.

I find, too, that the constant repetition of high thought and noble language improves my own thought and expression, especially in prayer.

While committing the Bible to memory, cares, worries, bitter thoughts, vain regrets, morbid fancies and all the jumble of things that lumber an unoccupied mind are

crowded out. By frequent repetition, rich meanings often stand out clearly in the lines, which would otherwise escape my notice. This growing familiarity with the Bible makes it ready for use in guiding my own way and in helping others. How can I walk and talk with God unless I have in mind some word of His to which I can respond, or which satisfies my own questions and aspirations?

Some time I may be deprived of reading, and then what riches I shall have in this store of Bible verses hid in my heart! Often in twilight or in helpless hours I say the sweet words over with a sense of comfort and companionship that otherwise I should miss. Then besides all this, I believe that one of the great joys is tracing out God's providences in the light of His Word, and for that reason I can never be too familiar with the Bible.

HOW A BOY GOES TO COLLEGE.

WHEN Jacob Shankman, the youngest sophomore in Harvard University, hears anybody say "I wish I could get a college education" he just laughs. Because young Shankman has found out how to do it and accomplish it without hardship. His system involves nothing more complicated than work, saving and safe investment, and when the efficacy of those methods are doubted he points proudly to the fact that they got him through the freshman year in college at the age of 14.

He started putting his system into practice nearly three years ago. While attending school at Chelsea, he worked during his vacation and saved his money, putting it safely into War Savings Stamps and Liberty Bonds. He worked as an office boy, as a census enumerator and as a book agent and when his advancement in his studies made it possible he worked in the day time and attended school at night.

He not only accumulated enough money to pay his college expenses but he has been able to set aside part of his Liberty Bonds and War Savings Stamps as protection against a "rainy day" which he says he hopes will never come but for which he is prepared. He is an enthusiastic supporter of investment in government securities because he is confident there is no investment so sound, and he is determined to keep some of his money where it will be available in time of need and yet will be safe and return fair interest.

Shankman says that what he has done is possible for the average American boy.

GIFFORD PINCHOT.

HIS PROGRAMME FOR SAVING OUR STATE FORESTS.

BY ALLEN SANGREE.

REPRESENTATIVES from all over the Keystone State associated with work at the Capitol in Harrisburg are turning their eyes these days to the Department of Forestry, formerly a remote and quiet section of the huge building, but now filled with a dynamic energy that awakes response from the stately forest monarchs, whose foliage shades the attractive park surroundings, and they seem to nod assent as there hurries along the alert figure of the new commissioner, Gifford Pinchot.

In the prime of robust life, profoundly interested and versed in the subject of forestation, equipped with Rooseveltian energy and vision, Mr. Pinchot greets the visitor with a hand grip that suggests years of woodchopping. Tall, muscular, active as a Boy Scout fighting a forest fire, there is sincerity in his gleaming eye, and we all know that the Latin meaning of the word "sincere" is "clean." Clean, indeed, is the new commissioner's program, and the hopeful fire warden from far-distant mountain country leaves the sanctum convinced that here is the man who will bring back riches, beauty and health through protecting and replacing the noble forests of Pennsylvania, which, as described by Governor Sproul, is "an empire in itself."

New idea? Certainly not. Way back in the days of our old friend William Penn the importance of woodlands to a country was realized, and in his charter of rights he set forth near the top a section:

"In clearing the ground care shall be taken to leave one acre of trees for every five acres cleared; especially to preserve the oak and mulberries for silk and shipping."

From the time of that far-seeing patron through a period of 200 years, almost to the present day, one may, in perusing the dusty departmental annals, note this year and that some suggestion for the protection of our precious forests. But in the light of what we know now it is amazing how dilatory Pennsylvania has been in this vital duty.

Just think of it, even though you be one who does not know a sycamore from a spruce, in the days of William Penn this commonwealth was one prodigious, glorious forest of nearly 28,000,000 acres covered with trees unsurpassed in variety and

character of species adapted to economic use. And now there remain less than a paltry 50,000 acres having primeval timber, and so brutal has been the decimation that the mighty state of Pennsylvania must import $50,000,000 worth of lumber each year at a cost of freight amounting to $25,000,000 more.

It is for this reason that Governor Sproul issued his impassioned Arbor Day proclamation to all citizens of our commonwealth to co-operate, saying:

"I call upon all good citizens of Pennsylvania to exercise watchful care against the starting of forest fires and to extinguish the same promptly when by mischance they occur, knowing that so to do is to perform one of the most important services that can be rendered to the present and future welfare of our state.

"Let teachers impress upon our boys, and girls this duty. Let ministers instruct their congregations. Let associations such as the Boy Scouts, granges, labor unions, patriotic and benevolent societies, chambers of commerce and the like join in this crusade to protect ourselves and our posterity. Let railroads take all steps needful to prevent or extinguish fires along their rights of way; let mines and factories see that no fires burn on or near their lands, and lumbermen leave no fire traps after logging. Let fishermen and all who use the woods for health or recreation see to it that their campfires are kept safe, and that carelessness does not endanger the forest which they enjoy. Let all good citizens resolve to protect and restore to beauty and commercial prosperity our forest lands, now so largely desolate and unproductive, by preventing and suppressing forest fires and by giving information against those who criminally or thoughtlessly endanger our forests with fire, and so detract from the comeliness and prosperity of our beloved commonwealth."

A fairly busy man in the Department of Forestry is George H. Wirt, chief forest fire warden. Concentrated on reports at the office, meditating, perhaps, where he shall take luncheon, or may be, snugly ensconced in bed of a night, the telephone hails him briskly and it is a distant voice of alarm from Cambria county:

"Forest fire just broke out here—burnin' like hell; send us help!"

And it is up to Mr. Wirt to hit the gravel with all speed.

His job is indeed discouraging, for incendiarism appears not to be considered a very savage misdemeanor by certain judges and severe punishment is too rare. Moreover, the culprits are often reckless boys, such as the lad who started a conflagration near Uniontown recently, the news being conveyed to the warden by a state trooper:

"Over 2000 acres burning now; got our hands full. Caught a boy fifteen years old who calls himself 'champion fire-bug'; says he set a couple other fires 'just fer fun'."

And a curious feature of this calamity was that a boy, according to testimony of the state police, had always been first to turn in and help the fire fighters. This strange appetite, the same which urged the Emperor Nero to fiddle and write odes while he gazed at all Rome burning, appears to be not uncommon in the records of the state's forest fires; imbecility and maliciousness are noted in some offenders, but the majority of blazes are the result of sheer carelessness.

Railroads are responsible for the greatest number of known causes, but if the fires of unknown origin could be rightly distributed, the chances are that the number set for brush burning, and by campers, fishermen and hunters would run a close second. A comparison by causes of forest fires in the years 1915 to 1918 show: Railroads, 1792; unknown, 2012; incendiary, 460; miscellaneous, 206; brush, 448; campers, 617; lumbering, 161; lightning, 37, with a total of 5826.

The area of state forests alone in 1918 which were burned off by the various ways mentioned amounted to 16,600 acres; most of the loss being in five counties.

Speaking for the whole woodland area, the department tells: "There are aproximately 7,000,000 acres of so-called forest land in Pennsylvania. All of it is exposed to the curse of fire. An average of 500,000 acres burns each year. Most of it is burned over every ten years. No system of forest management can flourish under such a condition. The direct loss from these fires is very heavy each year, and what the indirect loss is no one can calculate. Truly, we are extravagant people burning up millions of dollars and sitting supinely by and watching the smoke.

With the state almost stripped of its great woodland, what, then, is to be done by the new commissioner and his department? First, a campaign of education so that every man, woman and child in Pennsylvania will understand the necessity at hand. In Canada this essential was discovered long ago, when the commissioner of dominion parks published:

"For practical purposes there are only two kinds of fires—man-caused and those resulting from lightning. The latter we cannot prevent, but in regard to the former there does not appear any good reason

why a great deal cannot be accomplished. I do not admit that one fire in 10,000 is started maliciously. Practically all are caused through ignorance and carelessness. It is the old story, 'I didn't know it was loaded.' The obvious course, then, is to educate every man who by any chance may go through the woods to guard against doing anything which may start a fire.

"People have been educated to recognize the necessity of pure air; people have been educated to suffer the isolation of their loved ones in cases of contagious diseases. Surely there is no reason why they should not be educated in regard to forest fires.

"I think those who have studied the psychology of it agree that men are influenced by affirmation and reiteration. If a statement is affirmed vigorously enough and reiterated often enough practically all men finally accept."

It has been the custom of the Departmen of Forestry in this state for some years to issue literature on the subject, forest fire stickers; circulars on forest fire facts such as "Carelessness vs. Good Citizenship," and some 60,000 four-page circulars to school children. The appeals went to forest wardens, game protectors, timber cutters, railroad companies, dealers in sporting goods, ammunition manufacturers and publicity work of other kind was fostered, but now a definite plan to get this important matter before the public will be initiated.

Mr. Pinchot already has the pledge of thousands of Boy Scouts, for whom a badge of honor is devised. These willing helpers are to have the benefit of moving pictures to stimulate them, for the result of one film, "The Curse of the Forests," was such as to justify the state allowing expenses for the effort. The film was of two reels taken of a fire that actually burned at Mount Alto; two state foresters contributed the scenario and the actors were nearly all in employ of the department.

The picture opens with a lone ranger in a high treetop, as he must be sometimes today for the lack of towers for observation. This witness from his perch sees a camper leave the woods who does not put out his fire; not only that, but he tosses a lighted cigarette in the dry leaves to make sure. Hoping to handle the blaze alone, the trooper tackles it, but it gets beyond his control. There being no telephone, he must run five miles to the nearest forester's shack, but hours elapse getting an inadequate crew and silly tools, with the end of a disastrous three-day burn.

The second reel shows up-to-date methods with the ranger on a steel tower equipped with binoculars, who spots a fire and instantly telephones its direction to headquarters. In less than no time twenty men are on the way, automobile or horseback, equipped with modern fire-fighting tools.

In taking the picture the photographer barely escaped when a whirlwind which threatened to cause what is known as a "crown" fire swept the point. The camera man was for a while encircled in flames and forced to run for his life. But the picture has made a great hit wherever shown, and this method of publicity will now be employed more extensively.

The great mistake Pennsylvania made, along with other commonwealths, has been to use the forests, not as a crop, a renewable resource, but as a mine, to be worked out and abandoned. This is why Pennsylvania exposes to-day so many deserted villages and farms and millions of acres of burned forestry. To replace forests would mean the building of permanent, prosperous communities.

In Australia the undertaking of state forestry has been found a considerable remedy for rural depopulation, unemployment and pauperism. To-day some 15,000,000 acres in the United States proper are held by the federal government as national forests and some millions of acres by various states. The state of Pennsylvania very wisely has spent $2,300,000 in securing 1,000,000 acres of woodland, and the tentative draft for the new constitution includes the issue of a $25,000,000 bond for the taking over of another 5,000,000 acres. That forestry under state control will ultimately be a paying proposition would seem to be established.

When Governor Sproul recently appointed Gifford Pinchot commissioner of forstry he commented: "There is no politics in it. I have commandeered his services because in him we have a citizen who is the foremost figure in forestry in these United States, and I thought we should have the benefit of his services here at home."

As for Mr. Pinchot's efficiency in handling a job of these proportions, checking the fire destruction and rehabilitating Pennsylvania with the conifers, or softwood trees, the magnificent white pine, spruce and larch; the hard woods, white oak, red oak, honey locust, black locust, sugar maple, black walnut, black cherry, tulip poplar, white ash, basswood sycamore, shellbark hickory, black birch, beech and the cucumber tree, we have the hallmark of Theodore Roosevelt, who left this testimony:

"Gifford Pinchot is the man to whom the nation owes most for what has been accomplished as regards the preservation of the natural resources of our country. Taking into account the varied nature of the work he did, its vital importance to the nation, and the fact that as regards much of it he was practically breaking new ground, and taking into account also his tireless energy and activity, his fearlessness, his complete disinterestedness, his single-minded devotion to the interests of the plain people, and his extraordinary efficiency, I believe it but just to say that among the many public officials who under my administration rendered literally invaluable service to the people, he, on the whole stood first."—*Phila. Press.*

OUR OPINIONS.

WRITER SAYS WE DO NOT GET THEM, BUT THEY GET US.

IF we seek the cause of fixed opinions we find a most interesting human characteristic. Experiences organize themselves into systems of ideas. We do not get these opinions. They get us. We grow into them through the influence of the newspapers that we read and the views that we hear from people in "our class." And, unfortunately for progress, the so-called classes are about as isolated as animals on an oceanic island and separated from those on the mainland. These systems of thought become organized as fixed mental complexes. Enthusiasts display them in their hobbies. Some men, for example, bore us with golf, or photography, or with their particular brand of reform. Such mental complexes are usually harmless to society and diverting to their possessor. But where important matters are at stake these fixed systems of thought blind us to the essential factors of the problem. We cannot understand opposing arguments. We are biased toward all questions to which our system of thought apply. And, under these circumstances, thinking is a rearrangement of our prejudices.

New ideas may be inserted into these mental complexes provided the operation does not disturb the old thoughts. Doctor James Simpson, a Scotch physician, has shown how the mental surgeon should proceed, to graft new ideas on to the old. Anesthetics had just been discovered and the good doctor was one of the eccentric physicians who believed in their use. But the opposition was bitter. No physician could use them and keep his social standing or his practice. Pain was God-given, it was said, and any attempt to alleviate it was an effort to thwart His will. The situation was critical. A major operation was clearly needed. So the doctor wrote a pamphlet in which he said: "My opponents forget the twenty-first verse of the second chapter of Genesis. It is the record of the first surgical operation ever performed, and that text proves that the Maker of the universe, before He took the rib from Adam's side for the creation of Eve, caused a deep sleep to fall upon Adam." Doctor Simpson's operation was successful. The patients suffered no mental shock, and thinking proceeded as before.—*Scribner's.*

ROAD WORKERS.

DO you remember David Grayson's delightful book, "The Friendly Road"? And do you remember that interesting character, the road worker? The road worker was worried about ruts. He noticed how people enjoyed riding in them. and, of course, that made the ruts deeper, and the roads worse. A stray stone thrown into the rut would give teams a dreadful jolt, so that the drivers would realize 'twas high time the road was mended, and ruts forsaken!

To mend a road is a long and tedious task if there's but one laborer employed; but a multitude of them eager to make that road the finest in that community, accomplish marvelous results in a short time. Remember they must have an ideal; they must work faithfully and intelligently; and they must work together to make that road a joy to themselves and their community.

Now did you know that there is a great "Highway of Attendance" leading to our schools? And there are ruts, deep ruts, so that the road is not so pleasant to travel, and we find a few attendance officers, and teachers, and parents and many children slipping into byways. That will never do! The children are apt to get lost! They may stray into the paths of ignorance and grow up before they find their way back. They'd miss the chance of learning how to appreciate so many things in life; and their poor souls would shrink!

So, here's a call to road menders! Come, make a beautiful road! Dig up, and shovel; fill in the ruts! Work hard to accomplish the task.

Attendance Officers! Your tools are the laws ,enforce them strictly, justly! Parents! You shall work with "Co-opera-

tion." The teacher and Attendance Officer are your friends, your co-workers, to help build for *your* child. If you meet with difficulties, go to them to explain the law, or to give you advice, or to help, or to solve your child's problem. Remember they are at your service with their best abilities. Teachers! Your tools shall be the reports of absentees sent to your attendance officers. If they are inadequate and inaccurate, that Highway will never do for good traveling!

We are resolved that our Commonwealth shall be proud of this Highway. We are resolved that we shall work together to have all children of school age receive that education to which they are entitled.—*Miss Mildred Fischer, Supervisor of Attendance, State Attendance Bureau.*

HIS GIFT.

SOME years ago there died in one of our Southern cities a man whose rules of life were so different from those of his neighbors that most of them thought him hardly in his right mind.

He lived in a spacious old house, surrounded by a garden, which he had bought forty years ago. Large blocks of business houses now hemmed it in, and he was offered a price for his lot which would have made him rich. But he would not sell it.

"This is home to my old wife," he said. "I could not buy for her with the money you offer the comfort and content she has in her home and garden."

"But you can make your sons rich," it was urged.

"I do not want to make them rich," he replied.

His neighbors sold their lots, speculated, amassed large fortunes, pushed their sons into politics, or made them manufacturers or brokers, that they might amass still larger wealth. He made of his boys working horticulturists, like himself.

"It is a business which will give them comfort, but not wealth," he said. "In it, too, they will not be employed by other men, nor employ many hands, and so will be outside of any future struggle between capital and labor in this country."

When he had gained a sum large enough to keep his wife from want if she should survive him, he gave up his vineyard and gardens to his sons and devoted the rest of his life to charitable work and to the culture of a new grape of a peculiarly fine flavor. When he had succeeded in bringing it to perfection he gave cuttings from it to all the poor horticulturists that he knew.

"A man," he said, "should try to leave the world richer by something for his having been in it. Some men leave a great picture, or a book, or noble thoughts, to it. I have only a grape to give.

He gave it with all his heart. His neighbors, whose business in life had been to gather great heaps of money, called him eccentric. Judged by all that is noble in life, who was more sane, he or they.—*New World.*

HOW THE BOYS AND I LEARNED TO USE THE LIBRARY.

WEEK after week the librarian left his card list in our class, and removed it again untouched and unnoticed. I knew some of the boys were reading books of less profit, and I strove to think of some plan to improve the character of their literature, and to interest the other boys in books.

One Sunday I took the card, and read among the books for our class for that week "Schonberg-Cotta Family," by Mrs. Charles. An idea struck me.

"Boys," said I, "how many have read this book?" No one had. Then I told enough of the story to excite their interest, stopping just where they cared to have me go on. One boy immediately decided he would take the book. Another would have it next week. They all wanted it at once.

It would not do to allow this enthusiasm to cool, so I said:

"Let Hale take the book and read what he can by Tuesday after school, then if you will stay for half an hour"—for I was their day-school teacher as well—"he will tell us the part he has read, and I will read to you, and we will talk again about it."

The boys all liked the plan except Alfred, who couldn't stay long on account of the chores at home. However, we were to try it at once. Meantime, I informed myself more definitely of the time, and country and history of the story. I gathered interesting facts about the customs of the people. I tried to read effectively and rapidly. Points on which we were not well informed were given out to be read up for next week. Most of the boys would have overstayed the half hour, and when they left each had a topic for reading that interested him.

The next week there were other bays and some girls. Then we found it better to meet in the evening for longer time.

We read "On Both Sides of the Sea," by the same author, in the same studious manner. By this reading we acquired fine

lessons in history. We read, and even learned, some of the sweet poems of Mrs. Charles. Some one brought an illustrated magazine containing a sketch and pictures of the author and her home. In some way it led to those boys of fourteen being interested in D'Aubigne's "History of the Reformation," DeStael's "Germany,," and Max Muller's "Chips from a German Workshop."

It had been my fault that my boys did not read. They were ready and happy as soon as I pointed out an inviting way. We need not wait until our libraries are weeded of poor books and replete with good ones, nor until we have read a dozen books ourselves. Let us begin with the little bit we already know, and show our pupils how to acquire that. We shall add to our store as well as they, and there will be a new bond of union between our classes and oursevles.

THE SHORTEST SERMON.

TWICE requested to make his sermon brief, Rev. Henry Gillingham, pastor of the Atlantic Methodist Church of Atlantic, a village near Houghton, Michigan, preached one of the shortest sermons on record.

At the close of Sunday-school one of the church officers said to the minister: "It is very warm, and I hope you will make the sermon short to night."

The pastor accepted the wish in good humor. He went to the evening service prepared to make a 30 minute discourse. As he entered the vestibule of the church, however, he met another prominent member of the congregation, who accosted him with: "Very warm to night. Hope you will make it short!"

Mr. Gillingham changed his mind about the 30-minute sermon. During the opening exercises he prepared another, which he thought would be suitably brief. When he arose to announce his text he remarked that he had twice been asked to make his sermon short, and he would try to do so. If this should seem too long, he would stop next time with the text. Then he delivered this sermon:

Text: Luke xvi. 24: "And he cried and said, 'Father Abraham, have mercy on me, and send Lazarus, that he may dip the tip of his finger in water and cool my tongue, for I am tormented in this flame.'"

Three persons—Abraham, Dives, Lazarus. It was hot where Dives was. He did not like it. He wanted to get out. So do we. Let us pray!

That was the whole sermon.

STIMULUS.

IN an address on "Stimulus" by Professor Sidgwick, of Oxford, formerly for many years tutor at Rugby, I find some points in school work so excellently presented that I think them deserving of a wide circulation. His address appears in a small volume entitled, "The Practice of Education," from the Cambridge University Press. For instance, in speaking of school discipline, he says: "Discipline must be always at hand and ready, but stimulus is the more excellent way. A form kept attentive by stimulus is as different as possible to the eye from a form kept attentive by discipline. In the former there is life; in the latter there is stagnation. Schoolmasters, like other despots, sometimes make a wilderness and call it peace. It is tempting because it gives them no trouble, but it is bad. I will illustrate my meaning by an analogy. At Rugby we used to have a lesson before breakfast—seven to eight. It was always the quietest lesson; somnolence and hunger combined made the boys indisposed to any movement. After breakfast they came back different creatures; there was more vitality. There was less of the pin-dropping silence of the morning hour; but for real teaching the second was the best. And some masters act like hunger on the boys; others act like breakfast. To put it in one word,—in a form there should be attentiveness, but there should also be life; attentiveness without life is a mistake."

In discussing methods of stimulating the attention of pupils he has this to say of the miserable habit of nagging: "By nagging I mean a constant fire of little rebukes to one and another for inattentiveness. It wears out the patience of the best-regulated boy to receive, or even to hear such rebukes. It is exasperating to human nature and is utterly futile. Moreover, it distracts and worries the teacher, and destroys even what chance there was of any real stimulus to attention. My own advice would be this: "You may have in many lessons to caution once or twice; but if you find the thing becoming common, look elsewhere for the cause and for the cure. The probability is you are becoming dull. Either quicken up a bit, or at any rate vary the proceedings; but don't nag. It may, of course, be not your fault. The weather may be hot, or there may be some unusual excitement—a great match after school, or races in the vicinity, or some new promotions to the eleven, or news has come that the ice bears on the reservoir. Anyhow, don't nag. If it is

hot, open the door and any remaining window; if it is an excitement, try and compete with it rather than choke it by nagging. I have learned the futility of this method by having tried it and failed."

I have been interested in what Professor Sidgwick says on this subject. One of the most painstaking, earnest, and faithful teachers I have ever known was a most persistent "nagger" of children. All day long it was an unbroken outpour of small criticism, faultfinding, objurgation, rebuke, warning, and outcries of reproof or caution to Johnny and Jimmy, and Mary and Sarah. It all did no good. Most of the children looked harassed and tired; others utterly brazen and indifferent. The good woman meant well, and thought she was doing the best thing in the world in the way of her duty, whereas she could scarcely have been doing anything worse. Nothing will spoil a horse more surely than a constant see-sawing on the bridle, jerking him in and urging him on. A child's nervous system is certainly not less finely organized than that of a horse.

PROFESSIONAL SPIRIT.

THE teacher should show a professional spirit by his support of the current periodicals and the standard literature of his profession. I do not discuss this question from the standpoint of his own progress and his own good. This should be too apparent to need serious discussion. It is not my theme now. When I step into a lawyer's office and find shelves filled with professional books and his table laden with law reports, I cannot help having an increased respect for the lawyer. If I am admitted to my pastor's study and find a well selected and extensive library, a feeling of satisfaction comes over me in the thought that he who ministers to my spiritual wants recognizes also that I have intellectual needs, and that he has provided himself with the books with which he may prepare himself to meet those needs. So, too, the teacher who surrounds himself in his study with these necessary instruments of his professional advancement, commands respect hereby. He owes a duty to those who have made special books for teachers, and to those who publish educational journals. The better support given to these enterprises the more they give back in return. Publishing educational literature in this country is still in the pioneer stage. Authors, editors, and publishers are not getting rich out of these ventures and will not until there is a far greater disposition than now exists on the part of the great body of teachers to support them. Better support means better books and better papers. There has been a great improvement in late years in this direction, and that is why we already have such excellent books. A proper professional spirit among teachers would call for such support of these interests as would cause a mighty advancement all along the line.

POEM OF LIFE.

BORN of love and hope, of ecstacy and pain, of agony and fear, of tears and joy—dowered with the wealth of two united hearts—held in happy arms, with lips upon life's drifted font, blue-veined and fair, where perfect peace finds perfect form—rocked by willing feet and wooed to shadowy shores of sleep by siren mother singing soft and low—looking with wonder's wide and startled eyes at common things of life and day—taught by want and wish and content with the things that touch the dimpled flesh of babes—lured by light and flame and charmed by color's wondrous robes, learning the use of hands and feet, and by the love of mimicry beguiled to utter speech—releasing prisoned thoughts from crabbed and curious marks an tattered leaves—puzzling the brain with crooked numbers and their changing, tangled worth—and so through years of alternating day and night, until the captive grows familiar with the chains and walls and limitations of a life.

And time runs on in sun and shade, until the one of all the world is wooed and won, and all the lore of love is taught and learned again. Again a home is built, with the fair chamber wherein faint dreams, like cool and shadow vales, divide the billowed hours of love. Again the miracle of birth—the pain of joy, the kiss of welcome and the cradle song, drowning the drowsy prattle of a babe.

And then the senses of obligation and wrong—pity for those who toil and weep—tears for the imprisoned and despised—love for the generous dead, and in the heart the rapture of a high resolve.

And then ambition with its lust of pelf and place and power, longing to put upon its breast distinction's worthless badge. Then keener thoughts of men, and eyes that see behind the smiling mask of craft—flattered no more by the obsequious cringe of gain and greed—knowing the uselessness of hoarded gold and honor bought from those who charge the usury of self-respect—of power that only bends a coward's knees and forces from the lips of fear the lies of praise. Knowing at last

the unsteadied gesture of esteem, the reverent eyes made rich by honest thoughts and holding high above all other things—high as hope's throbbing star about the darkness of the dead—the love of wife and child and friend.

Then locks of gray and growing love of other days and half remembered things —then holding withered hands of those who first held his, while over dim and loving eyes death softly presses down the lids of rest.

And so, locking in marriage vows his children's hands, and crossing others on the breasts of peace, with daughters' babes upon his knees, the white hair mingling with the grey, he journeyed on from day to day to the horizon where the dusk is waiting for that night—sitting by the holy hearth of home, as the last embers change from red to gray, he falls asleep within the arms of one he worshiped and adored, feeling upon his pallid lips love's last and holiest kiss.

THE MINISTERING ANGEL.

"ONCE upon a time," on a summer's day, in the afternoon, a school overcome by heat, confinement, and the spirit of mischief, had by various misdemeanors common to such little people, exhausted the good nature of the teacher. It was one of those afternoons which come sometimes in school life, when meddlesome "Nick" turns books and brains upside down, and everybody says, "That's right, keep on, we'll all help." Even the "best boy in school," Joel Goodhue, joined the ranks (a little in the rear), and as for the "worst boy," Tom Teaser, he found his match in more than one instance on this occasion.

Black marks, zeros, and checks were too numerous to mention. T. T. having received some fertile strokes for pulling a long golden hair from Daisy Dow's head, sulked and idled. Master Snip, a small boy out at the elbows, but in for fun, stood in the corner blindfolded, for touching the tip of his little pug nose to the inkstand, and then looking about with an air of mock innocence at the gigglers, as much as to say, "W'at ye'r laughin' at?" Mary Smallweed, pretending to cipher was detected in designing an outline not suggested by the drawing manual, a bald headed profile, blink-eyed and long-nosed, with the word teacher underneath. A little girl who failed on the word "feathers" (which she spelled f-e-t-t-e-r-s) cried to be let loose and go home. A little boy cried about nothing in particular, except to help the game out. A large boy dropped his slate and picked it right up, so as to have it ready again to drop at the next favorable opportunity.

Mischief frolicked behind the first class in geography, the second class in reading, and the third class in arithmetic, down to the last youngster that stood at the foot of the primer class, trying to place his little ragged toes "on the line,," and read, "It-is-a-hot-day. Let-us-go-to-the-woods-and-find-a-cool-place." I have no doubt that acting upon the suggestion from the primer, an impromptu picnic would have been a mutual delight to all hands. In the midst of snickering, bustling, murmuring, imitation, sneezing, drowsing, and general restlessness, a little hand, like a white lily out of a bubbling stream, rose up and a little voice piped, "Pleath can we thing John Brownth body?" With the happy thought of the child came a deeper one of the teacher, who seemed to hope that through music the troubled waters might be calmed, as she smilingly consented to the gentle request. Of course there was a general rush and smash for singing books; but when each listening ear could hear the clock tick, and the song came forth, how the chorus swelled and burst from every heart! How the young forms sat up in orderly array, and raised their happy voices! How comfortably the teacher leaned back in her chair with folded hands! Little Snip in the corner, blindly forgetful of his smutty nose and punishment, felt that his heart and soul could "march on" in song, and lead all the rest, which he did successfully. Even Tom Teaser, who sulked through the first two verses, hustled out his book and found the place just in time for the third chorus. The summer breeze blew in and out, carrying the "Glory, Glory, Hallelujah," across the meadows and cornfields, where each silken tassel caught the mighty strain and tossed it to its neighbor. The honey-bee buzzed away, to carry the enchanting notes to the hearts of all the wild flowers; and what with insect voices above and below the grass, and the joyous carol of the birds, the sweetest concord that ever filled the air came echoing back to the old red school house.

Then the children sang, "Love One Another," "The Happy Days at School," and "Jesus Tender Shepherd," and somehow when lessons were resumed, a quiet, earnest interest seemed to have dropped like a holy spell upon the young assembly.

When the hour of dismissal came, and the long line, one by one, passed out on tip toe, who was the last scholar that looked real sorry, and tried to tread softly

as best he could, with his weather-worn clumsy cow hides? Why, T. T., of course. * * *

How fondly welcome to the school-room must that power be, which can sometimes lift the little hearts out of weariness, and, like a fragrant summer rain, cool the heat of long tired patience, carrying away with its gentle departure, all the dust of ill-temper and naughtiness.—*N. E. Journal of Education.*

HAPPINESS THROUGH THE SENSES.

UNLIKE the other senses, the eye is always at work except when we sleep, and consequently is the vehicle of far more enjoyment than any other organ of sense. It has given our race its ideas of infinity, symmetry, grace and splendor; it is a chief source of childhood's joys and throughout life the guide to almost all pleasurable activities. The pleasure it gives us, however, depends largely upon the amount of attention we pay to the pictures it incessantly sets before the brain. Two men walk along the same road; one notices the blue depths of the sky, the floating clouds, the opening leaves upon the trees, the green grass, the yellow butterflies, and the far stretch of the open fields; the other has precisely the same pictures upon the retina, but pays no attention to them. One sees, and the other does not see; one enjoys an unspeakable pleasure, and the other loses that pleasure, which is as free to him as the air. The beauties which the eye reveals are infinitely various in quality and scale; one mind prefers the minute, another the vast; one the delicate and tender, another the coarse and rough; one the inanimate things, another the animate creation. The whole outward world is the kingdom of the observant eye. He who enters into any part of that kingdom to possess it has a store of pure enjoyment in life which is literally inexhaustible and immeasurable. His eyes alone will give him a life worth living.

Next comes the ear as a minister of enjoyment, but next at a great interval. The average man probably does not recognize that he gets much pleasure through hearing. He thinks that his ears are to him chiefly a means of convenient intercourse. But let him experience a temporary deafness, and he will learn that many a keen delight came to him through the ear. He will miss the beloved voice, the merry laugh, the hum of the city, the distant chime, the song of the birds, the running brook, the breeze in the trees, the lapping wavelets, and the thundering beach; and he will learn that familiar sounds have been to him sources of pure delight—an important element in his well-being. Old Isaak Walton found in the lovely sounds of earth a hint of heaven:

How joyed my heart in the rich melodies
That overhead and round me did arise!
The moving leaves—the water's gentle flow—
Delicious music hung on every bough,
Then said I in my heart, If that the Lord
Such lovely music on the earth accord,
If to weak sinful man such sounds are given,
Oh! what must be the melody of heaven!

A high degree of that fine pleasure which music gives is not within the reach of all, yet there are few to whom the pleasure is wholly denied. To take part in producing harmony, as in part-singing, gives the singers intense pleasure, which is doubtless partly physical and partly mental. I am told that to play good music at sight, as one of several performers playing different instruments, is as keen a sensuous and intellectual enjoyment as the world affords.

These pleasures through the eye and ear are open in civilized society to all who have the will to seek them, and the intelligence to cultivate the faculties through which they are enjoyed. They are quite as likely to bless him who works with hand or brain all day for a living, as him who lives inactive on his own savings or on those of other people. The outward world yields them spontaneously to every healthy body and alert mind; but the active mind is as essential to the winning of them as the sound body.

There is one general field of knowledge too much neglected in our schools and colleges which offers to the student endless pleasures and occupations through the hearing and touch. I mean the wide field called natural history, which comprehends, geography, meteorology, botany, zoölogy, mineralogy and geology. Chas. Darwin, the greatest naturalist of this century, said that with natural history and the domestic affections, a man might be truly happy. Not long ago I was urging a young naturalist of twenty-six to spend the next summer in Europe. He thought it was hardly right for him to allow himself that indulgence; and when I urged that the journey would be very enjoyable as well as profitable, he replied, "Yes, but you know I can be happy anywhere in the months when things are growing." He meant that the pleasures of observation were enough for him when he could be out of doors. That young man was poor, delicate in health, and of retiring and diffident dis-

position; yet life was full of keenest interest to him.

Our century is distinguished by an ardent return of civilized man to the love of nature from which books and urban life had temporarily diverted him. The poetry and the science of our times alike foster this love, and add to the delights which come to the lovers of nature through the keen senses, the delights of the soaring imagination and the far-reaching reason. In many of our mental moods the contemplation of nature brings peace and joy. Her patient ways shame hasty little man; her vastnesses calm and elevate his troubled mind; her terrors fill him with awe; her inexplicable and infinite beauties with delight. Her equal care for the least things and the greatest corrects his scale of values. He cannot but believe that the vast material frame of things is informed and directed by an infinite intelligence and will,, just as his little animal body is informed by his own conscious mind and will.

It is apparent from what I have said of pleasures through the eye and ear, and from contact with nature, that a good measure of out-of-door life is desirable for him who would secure the elements of a happy life. The urban tendency of our population militates against free access to out-of-door delights. The farmer works all day in the fields, and his children wander at will in the open air; the sailor can see at any moment the whole hemisphere of the heavens and the broad plain of the sea; but the city resident may not see a tree or a shrub for weeks together, and can barely discern a strip of sky as he walks at the bottom of the deep ditches we call streets. The wise man whose work is in the city, and indoors at that, will take every possible opportunity to escape into the fresh air and the open country. Certain good tendencies in this respect have appeared within recent years. Hundreds of thousands of people who must work daily in compact cities, now live in the open suburbs; cities provide parks and decorated avenues of approach to parks; out-of-door sports and exercises become popular; safe country boarding schools for city children are multiplied, and public holidays and half-holidays increase in number. These are appreciable compensations for the disadvantages of city life. The urban population which really utilizes these facilities may win a keener enjoyment from nature than the rural population, to whom natural beauty is at every moment accessible. The cultivation of mind and the increased sensibility which city life develops heightens the delight in natural beauty. Moreover, though man destroys much natural loveliness in occupying any territory for purposes of residence or business, he also creates much loveliness of grassy fields and banks, mirroring waters, perfectly developed trees, graceful shrubs and brilliant flowers. In these days no intelligent city population need lack the means and opportunities of frequent out-of-door enoyment. Our climate is indeed rough and changeable, but, on the whole, produces scenes of much more various beauty than any monotonous climates, while against the occasional severity of our weather, artificial protection is more and more provided. What we may wisely ask of our tailors and landscape architects is protection in open air from extremes of heat, cold and wind. The provision of an equable climate indoors is by no means sufficient to secure either the health or the happiness of the people.—*From President Eliot's Address on "The Happy Life."*

LIBRARIAN AS A TEACHER.*

BY JOHN H. FINLEY, LL. D.

WITH this demand of the human mind, inquiring, progressing, unsatisfied, there has come to be the need of those (library scientists) who can put it in the way of making its communication with what has been thought and done on any road along which other minds have traveled,—to connect every eager mind with the cosmos, and to stimulate those that are not eager to find this communion.

A few mornings ago, at breakfast, there sat opposite me at table an astronomer who was coming from his night's work as I was going to my day's work, and we at once began to talk "shop," his "shop," i. e., about the stars which were in his shop's ceiling. He informed me in the course of the conversation that there are now known to be worlds whirling in space 375 quadrillions of miles away. In rising from the table I found that I had been sitting back to back to Herbert Putnam, librarian of Congress, who asked as I passed: "Do you generally begin the day with such cosmic conversation?" With the assistance of a skilled librarian one might begin every day with conversation, and find one's world made new! You are the representative of the cosmos, in a very proper sense; so much of the cosmos,

* Portion of an address delivered before the graduating class of the New York State Library School, Albany, N. Y., June 11, 1920, by John H. Finley, Commissioner of Education, New York.

at any rate, as is articulate, and to such part of humanity within your reach as is spiritually literate.

And a library is in its functioning primarily an educational institution, a place not simply of storage, of preservation, but of teaching.

And more and more essential to the life of our people is a library, not onlv because of its practical ministry in giving information essential to progress in production, essential to efficiency in the crafts (the mysteries as they were once called), but also because of its ennobling and enriching contribution to the increasing leisure of millions, whcih must be increasingly be an end of education.

For the librarian, such as you have been trained to be, is primarily a teacher, the successor of the old type of professor whose "chair" was a "bench"—(as my professor of chemistry, who was also a librarian). It is proper and gratifying that the state librarian is a Doctor of Teaching. Certainly he deserves to be ranked high among the great teachers of this state, and especially as a teacher of teachers, in this school, the best of its kind in the world, as I suppose, the members of whose faculty are our only university professors, and you—gathered from many states of the Union and many countries of the world—our only university students within the physical walls and hall of this "otherwise mystical university."

You go forth as teachers to teach:—

1st. By influencing the character of the reading of the people.

2nd. By guiding to a considerable extent the free study of the adult.

3rd. By erecting, organizing and administering halls and places of study.

4th. By organizing public discussions and public lectures.

5th. By making books living things, because of your breathing upon them.

I look forward to the day when we shall have a system of adult education in the state which will reach every man and woman as we are now reaching every child. And the librarian will be as important a factor in that place as the formal teacher or the lecturer, perhaps the most important and inspiring factor.

I once long ago wrote some lines to a bookworm:—

O gentle one, most wise, though oft denounced a pest,
Who didst the pages of the ancients' books infest,
Their contents chew upon and inwardlv digest,
I envy thee when o'er thy course I look.

For 'twixt the vellum walls of some sweet classic tome
'Mid leaves ink-scented, thou didst have thy cloistered home,
All margined round with virgin fields in which to roam
Whene'er thou caredst to leave thy lettered nook.

And when thou'dst riddled thy last line, O Ptinidus,
What happy destiny was thine, denied to us,
To lay thy sapient bones in such sarcophagus
And be forever buried in a book.

But that was before I came to know the trained librarian. I envy not the bookworm's lot or fate, but rather that of the book-prophet who keeps the cosmic winds breathing life through every shelf.

I salute you as leaders in this occupation which has been exalted into a profession, as cosmic conversationalists, as teachers of men and women as well as of children, as bachelors of library science, and on behalf of the university I admit you to the degrees which you have so worthily earned.

SILENT READING.

BY SARAH H. FAHEY.

WHEN I speak of silent reading I have in mind, as I suppose we all have, the ability, however acquired, of penetrating or comprehending the thought involved in the printed page—not rhetorical utterances—not expression—simply the getting of facts, ideas or emotions.

In this country the people who apparently read may be counted by the million, yet the majority do nothing but skim the newspapers. The world is not much the wiser for a good deal of the so-called reading which goes on in it. Many do not profit by their reading because they do not know how to read. They have never been taught. It is not how much we read, but the quality of the reading and the manner in which we read which counts.

When the necessity for silent reading is urged in the schools, teachers often think that a great quantity of reading is necessary. That is not true. If books are rightly chosen children will read them silently many times during their school life. A child may be gorged by too many books. Pupils often say, "I have gone through that book," indicating by their very remark how little they have gotten out of it.

Accurate thinking on any subject depends largely on the ability to see what is there, yet children are constantly seeing it correctly. If we are to consider only

the economy of school work and the convenience of the teacher, how necessary it is that the schools so teach that the child reading silently can read intelligently. When a child fails to work an example, how often the teacher says, "Read it again." Suddenly a look of intelligence flashes across the child's face, he reads the problem and solves it in the same breath."

Oral reading, which involves not only thought-getting but thought-giving, is dependent absolutely on the power to interpret the thought. For example, a child is reading aloud in a vacant sort of way. The teacher says, "Look at it," "Think what it means," or by a suggestive question leads him to see it. Instantly the tone changes. He has comprehended what is there, and is now ready to transmit his thought to his hearers.

Are you not constantly finding out that some boy is unable to prepare his lesson in geography or history because he has not been helped to read the text-book? He tells you what he thinks is there, which is quite a different matter from that which is actually there.

Is it not paramount in importance that the child be taught very early in his school life to habituate himself to getting correct thought when reading silently? He will thus acquire the habit of seeking books on any and every topic of interest, and can help himself when the teacher is engaged with other pupils or classes.

I realize fully how futile it is to hope to make young readers very skilled in thought-getting. Reading is a very difficult art—so difficult that even Gœthe says, "I have been fifty years trying to learn to read and I have not learned yet." We cannot hope to perfect pupils, but is this an apology for not making at least a beginning?

If people do not acquire the reading habit in youth, the chances are they never will. After the early years the masses do not attend school. The pitiable part of it all is that many of these people close their school life with not even an introduction to reading in any true sense.

Yet our literature, in richness and variety, is second to none the world has ever seen. Think what silent reading really means to one who has mastered the art. A vast before unknowable world looms up for him. It extends his horizon in space and time, making his world immeasurably larger than it was before. It transplants him at will to different countries, among different people, with different conditions of life from his own. It is the next best experience to reality.

Then again, our moods are changed by proper reading. When we feel wearied, we are made to laugh; when we are ready to condemn, our sympathies are awakened; when we feel indifferent, we are roused to action.

In books, the choicest spirits of all ages entertain us, and what a power for good that means to us. Biographies of our greatest men all emphasize the controlling influence of books upon their lives. How impressivev are the words of Channing when he says:

"God be thanked for books. They are the voices of the distant and the dead, and make us heirs to the spiritual life of past ages. No matter how poor I am, no matter though the prosperous of my own time will not enter my obscure dwelling—if Milton will cross my threshold to sing to me of Paradise, and Shakespeare open to me the worlds of imagination and the workings of the human heart, and Franklin enrich me with his practical wisdom—I shall not pine for want of intellectual companionship, and I may become a cultivated man though excluded from what is called the best society in the place where I live."

What a great opportunity silent reading furnishes to get the ideas of leading thinkers of the present time. Instead of depending on casual rumor and loose conversation for knowledge and objects of thought—instead of forming judgments in crowds, and being excited by the voices of neighbors—people who can read silently, learn to study and reflect alone—to follow out subjects continuously and to call to their aid the knowledge, views and reasonings of men of all countries and ages—and the result must be a deliberateness and independence of judgment, and a thoroughness and extent of information obtainable in no other way.

Since such tremendous results are dependent upon the ability to interpret the printed page intelligently, we may profitably spend a moment considering ways and means of giving this power to some of our pupils.

One of the fundamental errors among teachers is the supposition that reading is easy to teach. Inexperienced assistants in training schools feel that very little preparation is necessary in order to give a reading lesson, although they will manifest a good deal of concern about any other work. The truth is that reading is perhaps the hardest subject in the schools to teach effectively. After the earliest school years, it is questionable how much positive teaching of reading is done. Teachers hear pupils read once a day. General expression is criticised, then the lesson closes. In a perfunctory way the children are given books to read silently,

but the teacher does not influence them to read. The children are naturally indifferent to the contents of such books.

The teacher must create a motive for reading. She must make the child get what she gets from a book, whether it be information, ideas or feelings.

Given a motive, and people will read the driest kind of material. Boys read football notes. Women read cook-books, societies read codes of parliamentary law, because they are interested in doing something, and they seek information with regard to that something. Is it not the teacher's business, then, to have in mind clearly what she expects a child to get from any given reading? Then she must in some way, whether by question or suggestion, stimulate the reader to want to get what is there. As a rule, do not assign reading by pages to the older pupils, as they will then look upon the work as a task to be rid of as soon as possible.

Train children to realize that the writer of a book wants to talk with them—that he selects his words carefully because he can say them but once—that they must look carefully and examine those words.

Pupils must be trained to realize that half of education consists in learning where and how to look for information. They must learn that books are merely tools of knowledge. It remains with them to get the spirit that is breathing beneath.

BISHOP JOHN H. VINCENT.

BY JOHN H. FINLEY.

State Commissioner of Education, Albany.

I HAD the great good fortune to be a resident of Chautauqua in the early and more primitive days, when Bishop Vincent (whom years before in my Western college town I had heard lecture on "That Boy") was a vibrant, sonorous force throughout this school in the woods. I was not a student, but I had many of the advantages of a student. The first year I was a proofreader on the Chautauqua Daily Herald and as such I read every line published about the daily life of this shut-away city in that modest sheet which reported from the outside world only two items, the price of oil being one. The other, as I recall, was the baseball scores of the preceding day. And then being promoted the next summer from proofreader and job printer to editorial writer for two summers, I myself chronicled and commented without censoring upon what was said and done in this microcosm—not a microcosm of the great world from which this little city was shut away but of the better world which that stanch companion of Bishop Vincent, Lewis Miller, had in sight.

As editor I had freedom of all the halls and classrooms and open wisdom spaces, and, though I came with the superior air of a post-graduate student of a great university of that day, I found myself reverent, worshipful, under instruction, and often a stirred peripatetic note-taking auditor. I had been following through my professor of history in Johns Hopkins the idealistic university extension venture of Arnold Toynbee and others among the unprivileged of London. But here was a university extension for those who for the most part lived in solitary country places or villages or lesser cities, where the voice of the great preacher or teacher or scientist or author was seldom or never heard.

John the Chautauquan had lived in the solitary places himself; he had not had a college training; he had not heard the great voices of his day, though fortunately he had heard the voice of his God. He had himself made good his own losses through self-discipline, though indefatigable reading in English, through the study of Greek and French, through foreign travel, through association with interesting people. What he lost but found for himself he wanted the multitude to have. That is what the scientist would call the etiology of this movement. There were thus the assemblies, the gatherings of multitudes as on the shores of Galilee, but there were the periods of daily or weekly study in the lonely homes and the neighborhood village reading circles (the C. L. S. C.).

He was, to be sure, not formally nor by profession a teacher. He was a generic teacher. Those who heard his famous lecture "That Boy," perhaps did not realize that it was a pedagogical lecture. It seemed too entertaining for that. He was alive to the new tendencies in education.

But Bishop Vincent was notably a pioneer in insisting upon the possibilities of summer study. We were all made familiar in childhood with certain creatures which were said to hibernate—that is, to become torpid in winter. It was later in life that I learned of certain other creatures that aestivate—that is, are torpid in summer. These classifications apply as well to human creatures. Out on the prairies, where Dr. Vincent lived himself in youth and early manhood, there were some people who hibernated, but it was not until I came East that I became acquainted with those who aestivated—that is, became torpid at summer hotels and the like. I

do not believe that we need these long periods of torpidity, insistent as we must all be on relaxation and a due amount of sleep.

But it were not accurate to say of Bishop Vincent, "He did live," for still he lives as potently to-day as ever. And he will live on, for no life has illustrated more aptly the saying of Emerson, that "an institution is the lengthened shadow of a man"—a shadow in which millions have found and will find rest of body, refreshment of spirit and wisdom of mind and heart for the rest of their journey across the earth—a shadow stretching on as long as there is light to make a shadow.—*New York Evening Post.*

We add these paragraphs showing the interest of

BISHOP WARREN IN STAR STUDY.

Says Dr. McCaskey in his paper on Star Study, in the Report of the Pennsylvania State Teachers' Association (page 373) for 1918:

When the Star Club was holding its semi-monthly meetings, nearly forty years ago, in the crowded lecture room of the Young Men's Christian Association, I brought to the Fulton Opera House—with all their apparatus for illustration on a grand scale—two of the most noted lecturers of their day on astronomy, Bishop Henry W. Warren, author of the delightful book, "Recreations in Astronomy," and Richard A. Proctor, the distinguished author and astronomer of England, who was then lecturing in the United States. Both lectures were enjoyed by large and appreciative audiences. What audience could be too wise or too great for an intelligent discussion of the mechanism of God's universe? If there had been assembled in Fulton Opera House, in Lancaster, on these nights the thousand men, wisest and best, most capable, and most eager inquirers after truth the world has known in all its ages, they would have heard with deepest interest and wonder, the story of the astronomer, as to what has been discovered and is now known to be true of the stellar universe. Think of Abraham and Melchizedek, Moses and David, Pythagoras and Plato, Paul, John of the Apocalypse, Martin Luther, Shakespeare, Copernicus, Dante, Michael Angelo, Columbus, Herschell, Humboldt, Gœthe, Tennyson, Scott, Carlyle, Victor Hugo, Agassiz, Longfellow, Lowell—the wise men of the East, and the wise men of the West—all gathered into one audience, eager to hear the truths which the sublimest of all material sciences has thus far established! That were an audience indeed! worthy a subject of such magnificent proportions.

Bishop Warren, in a letter after receiving a pamphlet copy of the work of the Star Club, said: "I received my first lessons in astronomy before I knew the four fundamental rules in arithmetic. These lessons I have never forgotten. They have made me feel at home wherever I have turned my face to the skies, though I was on the great ocean, among the Alps, on the Pyramid, or under the clear sky of the East, where God, seeking to lift Abraham up to his own lofty thought, sand unto him, "Look now towards heaven and tell the stars if thou be able." Perhaps I did not thank the district school teacher as I should have done at the time, but I have blessed her ever since and am glad to say any word of encouragement to any that are following in her steps."

INBORN AND INBRED.

SANE qualities and instincts are in the very blood of us, so that while we live we cannot deny them or act in a fashion untrue to them. We depend on certain people, because we know that in their very natures they are noble; their essence is truth, and honor dwells at the core of their beings. They will surrender life before they will capitulate to any infancy.

There is a pride of life that is forever pointing back at a distinguished ancestor—and that form of ancestor-worship is worth very little if it does not lead to emulation of that which brought honor to the bygone figure. Whatever transmitted characteristics there may be, if a praiseworthy kind, they are obscured by the conceit that is forever prating of the mere descent. And sometimes the descent from the high plane on which our forebears lived is to an abysmally low level of thought and of feeling that shames all the past.

Much may be done toward implanting in a character what was not there by nature. It is the teacher's triumph to overcome heredity. Children of families depraved and debased have been redeemed by a loving patience that would not accept a failure.

For a letter to a younger brother the Russian writer Chekhov lists the qualities that are to be found in one who may rightly be called a person of culture. He tells his brother that his chief fault is his ignorance of the things that are beautiful to do and good to know; and this is a fundamental shortcoming.

The graces of character are not likely to come by training to one who neither knows nor cares what they are.

Some boys with their way to make in the world have never learned the first and the best of charms, which is that of gracious manners. Perhaps there is a fear of insincerity, because politeness has been the armor of some who were false at heart. But character never yet suffered from courtesy. No boast of family can hold a candle to social urbanity. What you are now to us means more than what your ancestors did to the British in the Revolution. If you have acquired no manners, who cares how many dollars you have rolled up? Your orations about your wealth and your consequence do not move us so much as the gentleness, simpleness and generosity of a poor man who is not proud.

"VALLEY FORGE FOREST."

AMERICAN Legionaries familiar with the French use of the word "forest" will see a peculiar applicability in the term "The Valley Forge State Forest," which has been decided on by State Forester Pinchot to cover the rough, hilly country in this southeastern corner of the commonwealth, in which he is establishing a state forest reserve. The various "forests" in France, as a rule, are coincidental with rough, hilly, mountainous areas. And it is the long preservation of these areas in the Vosges and in the Argonne along the Meuse and on the Luxembourg border that has given these portions of France the occasional suggestions of the forest primeval. With us the wilderness is not so far away; and while we have done little to preserve it, it exists by the fact of nature; so much so, as Mr. Pinchot pointed out recently, that we have over 6,000,000 acres in Pennsylvania too rough and too rocky for the plow, which must either grow trees or produce nothing, except, he might have added, those incomparable scenic beauties for which the mountain region and the hilly regions of our adjacent river valleys and uplands are so famous.

This great area that is essentially forest land covers one-sixth of the state. And, fortunately, so widely distributed is this unarable and rocky countryside, says the Philadelphia Ledger, that some of the most wild and picturesque reaches are found within an hour's motor or trolley or train ride of Philadelphia in Chester, Delaware, Montgomery and Bucks counties. That Mr. Pinchot starts his Valley Forge State Forest by the condemnation of the famous Haycock mountain, in Bucks county, will bring home to the citizens of this crowded section of the state just what forest preservation really means. For Haycock mountain is in a central district, which is bounded on the west by the real Valley Forge reserve, along the Schuylkill valley, while to the east, along the far-famed Delaware valley, there lie the famous Nockamixon cliffs and some of the most beautiful hill regions in America, from Buckingham mountain near Hatboro on the south to the South mountain ranges near Easton on the north. In and near the Haycock mountain occur the several outcroppings of Ringing Rocks, basaltic debris less famous than those near Pottstown but none the less picturesque, while on every side the close juncture of the highly cultivated lands in the rolling valleys, such as the countryside near Doylestown, afford remote and near-at-hand panoramas that are not surpassed in any rural region famed in song or story, or literature, or in the arts.

The Constable and Old Crome country of England is well known, but it must not be forgotten that the region whose preservation Mr. Pinchot is now looking to is the scenic section of Pennsylvania, made famous in landscape art by Redfield Garber, Lathrop, Pearson, Corson, Spencer, Birge, Harrison and others. This esthetic appeal was probably not the determining thing in Mr. Pinchot's mind, though it could not have been absent from it all together, for, of course, as he has repeatedly said, he seeks to get possession ultimately of all of these 6,000,000 acres as an investment that will underwrite the future of the state. From this it must be clear that there is a great deal more back of the Valley Forge State Forest than appears in the very simple but truly progressive announcement that it will soon be a fact to the extent of 7000 acres. As all know, this is a mere starter; but it is a fine earnest that at last we are in for a big move forward in forest preservation in Pennsylvania.

CONVERSATION: TWO TEACHERS.

1. My main objects are to make a good community; I try to have all cheerful and pupils quick at figures.

2. I cannot say that I make those my main objects. I look at the school as a community; I try to have all cheerful and happy; to have a spirit of helpfulness; to scorn meanness; to be interested in the great achievements of the human race; to want to find out about the world they live in; to aim to be in a better and more advantageous position to-day than yesterday.

1. But how about the spelling, the reading, the writing, and the arithmetic? It seems to me you are leaving those out en-

tirely. The parents will insist on your teaching them.

2. Let us take one thing at a time. Which is more likely to learn arithmetic, the happy pupil or the unhappy one?

1. Why, the happy one, of course. And I do all I can to make the schoolroom pleasant.

2. Don't you think of that all the time?

1. I suppose so.

2. Then it is a main object with you as with me. I consider the reading, writing, etc., as the results of industry, of well-directed labor, and so try to promote industry. I try to concentrate effort on the same things you do.

1. But why do you try to have them helpful?

2. A school is a community; and when persons live in communities their feelings are naturally aroused; those feelings must have expression; to repress them would stop their progress in reading and other studies. You know the motto of the New Education is, "Let the entire nature be addressed—body, mind, and soul."

1. In other words, you try to get up a state of development, and expect that the pupils will learn to read, etc., incidentally.

2. Not entirely so. I have a course of duties and labors to be performed, as reading, writing, etc.; but it is the spirit with which they are performed that I am concerned about. You see the school is an environment that may lift them up and make them nobler and stronger. Thousands learn to read and are just as low as before—they read the "yellow" journals and are perfectly satisfied.

1. Yes, I know that. I sometimes think it would be as well if some did not know how to read. What can be done in arithmetic to form character? That does not seem so easy.

2. I encourage cheerfulness; set so many problems, have them do them neatly, work faster to-day than yesterday, and appeal to their reason; repress any meanness, and give them full freedom.

1. Yes, so do I; but why freedom?

2. Because man as he rises tends towards freedom. I mean by that to act in accordance with their own motives and impulses, and not according to mine.

1. I hold them to the rules.

2. I try to have them make their own rules. I let them go from seat to seat, or whisper, only asking them to bear in mind not to disturb others.

1. My pupils would misuse such liberty. Don't yours roam around and cause trouble.

2. They did at first, but they have learned to use their liberty, and now do not often whisper. It is a great thing to put the responsibility on them.

1. But don't you often feel they make poor progress in reading—take spelling for example. Don't you find they fail to spell a word they ought to be able to spell?

2. Yes, that will occur, but the only thing I try to rouse is a spirit of cheerful industry, and set them to work on the proper things, and then if they fail I don't worry.

1. I think I have got some ideas from this talk, and shall try to put them in practice.—*Practical Teacher.*

WHAT THE ARMY IS DOING.

ARMY SCHOOLS FOR YOUNG MEN WHO WANT TO LEARN.

MAJOR EDW. W. MCCASKEY.

THERE are a hundred courses, twenty-five hundred classes and a hundred thousand students in the Army schools to-day. Military work takes about half time; student classes some three hours, practical work about three hours in afternoons, and in the evenings there are entertainments. All camps and large garrisons have schools. Camp Grant, Illinois, near Rockford, turns out practical teachers, also Camp Pike, Arkansas. Various colleges and universities have loaned high class experts and shopmen to assist the officers and non-coms with the lay-outs and tests. The work is much as follows:

1. Automotive work with gas engines of all sorts. Minor repairs of autos and trucks, and care of tools, gas and oils.

2. Electric work, both theoretical and practical dynamos, motors, winding, wiring and lighting, and cables. Signal work. Radio courses.

3. Building trades and shops, blue prints and plans, costs and actual building.

4. Textile work, raw materials, looms, cloth inspection and making into fabrics, uniforms, etc., and repairs.

5. Metal work, plumbing, pipe-fitting, tinner's work, etc.

6. Road making, photographical screens and routing, cuts and fills and bridges, surfacing and up-keep.

7. Music, orchestra and band, glee clubs and mass singing in chorus with band.

8. Machine shop work.

9. Business and commercial work, credits, pay rolls, costs of jobs and estimates, financial clerks' courses.

10. Agriculture and gardens, crops, costs and labor.

11. Foods and rations, baking, cooking, etc.

12. Athletics, boxing and track, football, baseball, tennis, etc., entertainments and movies.

The requirements for enlistment are an ordinary robust body, no serious sick record, and a decent character; three honest recommendations, and usually a fair public school education.

On the whole, the army life is a good one, and turns out real men, who are assets not liabilities. All necessaries are found, and the pay of the private is one dollar per day for extras. School seats all free.

The training at Camp Upton has Americanized hundreds and thousands of foreigners with amazing results. At Camp Humphreys courses are given in engineering; at Camp Knox in artillery; Camp Taylor, Kentucky, light artillery; Camp Jackson, South Carolina, heavy tractor artillery, at Fortress Monroe, coast artillery; Camp Bennings, in Georgia, is given to the infantry, to the machine guns and rifle work, Fort Riley in Kansas to the cavalry.

Chemical service has to do with gases and explosives. Sanitary service keeps down diseases and prevents epidemics. Medical service takes care of the sick and accidents. The construction division builds camps and turns out capable mechanics in all lines, clerks and printers. The Quartermaster supplies everything; the Finance section pays everything. The Motor Transport hauls the loads, and shows when the road work needs repairs, and these are made by the Pioneer Sections. Tests and ratings are standard. To many the Flying service is attractive.

To a youth from eighteen to twenty years of age a fine chance is here offered to get a line upon the life work to which he may be adapted, to learn a trade, a vocation or a profession. There may be upwards of a hundred thousand graduates per year. These courses are cut up into three months, six months, or one, two and three years, and all of them are practical. The men learn to do things by doing them under competent instructors. The discipline of the army has a wholesome effect upon men, making them more ready to meet any duty or danger. After forty years' service with troops I find—of this I am thoroughly convinced—that ninety per cent. of them are above the average of men in integrity and ability no less than in physical endurance.

There is a high sense of duty in the army and the discipline is just to all alike. The Golden Rule works better than in our civil life. If a youth has the goods and wants to learn, the army is a good training school at a critical period in the life of many young men. A soldier usually sees his duty and does it. He may growl some, but claims that as his privilege. Many graduates of college and universities are far below this standard, because of wasted time and money. The "roughneck" side of a soldier is often shown to civilians as mere bravado. Ninety per cent. of enlisted soldiers are, we have said, above the average of young men in civil life. They learn to work out their problems without fear or favor, and can always be depended upon in time of need. They stand for all that is manly and square, and will be better men in any walk of life after a course of a few years where no "pull" counts and every tub must stand on its own bottom! where results bring promotion and more useful life, helping others to help themselves.

ARBOR DAY AND BIRD DAY.

In the name and by authority of the Commonwealth of Pennsylvania.

THEODORE ROOSEVELT DAY.

I WILLIAM C. SPROUL, Governor of the State of Pennsylvania, do hereby designate and proclaim Wednesday, October 27, 1920, as Roosevelt Day, Arbor Day and Bird Day to be appropriately observed in the schools and elsewhere throughout the Commonwealth.

The purpose underlying the establishment of Arbor Day and Bird Day has been the conservation of our forests and the feathered life that inhabits them. It is peculiarly fitting, therefore, that we should combine these occasions with the memory of that American citizen whose life was so largely and effectively identified with these fields of conservation, Theodore Roosevelt.

During the administration of Theodore Roosevelt the National Forest Service took the longest strides that had ever been taken in the conservation of forest lands.

Mr. Roosevelt's efforts for the conservation of water power, mineral deposits and oil fields are almost as notable as his salvage of the forests for the public welfare, and during his administration millions of dollars had been spent on the reclamation of arid lands on which there have now been established thousands of farm homes of strong American citizens and hundreds of prosperous towns and villages.

His interest in birds is shown by his establishment of the First National Bird Preserve on Pelican Island, Florida. Before he left the presidency he had established fifty-one of these reservations as breeding grounds for various species of water fowl which have thus been rescued from exploitation and possible extinction.

But Mr. Roosevelt believed, too, in human

conservation. Throughout his whole busy life he never lost his interest in boys and girls. The letters which he wrote from time to time to his own children have been gathered together in a book which is a splendid tribute to his sympathy for childhood and youth.

Mr. Roosevelt is one of the great Americans. His public life was characterized by a fearlessness and sincerity that few men have possessed. He was a student, a statesman, a soldier, a naturalist, a hunter, an explorer, a writer, and he was all these to a distinguished degree. Few statesmen have achieved as much for their people.

It is eminently fitting, therefore, that all Americans, and especially the future citizens, the boys and girls who are to be the men and women of to-morrow, should know of this great man and from his life learn some of the lessons of personal character and public achievement that will help them to do their part in the service of their generation.

Given under my hand and the Great Seal of the State, at the City of Harrisburg, this fifth day of October, in the year of our Lord one thousand nine hundred and twenty and of the Commonwealth one hundred and forty-fourth.

WM. C. SPROUL.

By the Governor:
CYRUS E. WOODS,
Secretary of the Commonwealth.

TO SCHOOL OFFICERS, TEACHERS AND CHILDREN.

THE Honorable William Cameron Sproul, Governor of the Commonwealth, has issued the foregoing proclamation fixing October 27, the birthday of Theodore Roosevelt, as Arbor Day and Bird Day. The purpose of the Governor's proclamation is to have all the schools of the State observe not only Arbor Day and Bird Day in the usual manner, but also the birthday of Roosevelt, and to pay proper tribute to the memory of one of America's most eminent men.

I therefore urge every teacher and school officer in the Commonwealth to heartily respond to the request of Governor Sproul and, on the day set apart for this observance, to invite the public to join with the schools to give expression of appreciation of the services rendered by Theodore Roosevelt in raising the American people to higher standards of social, industrial and political life and in extending the power and influence of American institutions and ideals.

I am taking the liberty of saying to the school children of Pennsylvania what I said on a previous occasion to the school children of another great state:

"The scholarly attainments and the achievements in public service of Theodore Roosevelt have written his name in the history of America as one of our great national characters. Young men of to-day, and women too, should analyze the elements of his character and should study the rules of conduct in life which enabled Mr. Roosevelt to attain the commanding position which won him the approval, the esteem and the affection of his fellow countrymen while he lived and which grieved them when he died. Many of the dominant forces which controlled the life and conduct of this great man should be emulated by the boys and girls of to-day.

"Through his boyhood and when he entered Harvard, Mr. Roosevelt was weak physically, but determined to become a strong man. He became interested in outdoor life and in athletic sports. Through the sheer force of his will power he triumphed over his physical disabilities and became a veritable athlete. Many boys in his physical condition would have believed it impossible to develop into strong, robust men. Colonel Roosevelt did not believe in 'molly-coddles,' and as a boy did not allow others to make one of him. Again, he did not as a student or when he entered public life possess the gifts of a debater or public speaker, but he determined to overcome these handicaps and not only succeeded but became one of the most fascinating speakers in the country. Few men have been able to influence an audience with such appealing power as Colonel Roosevelt.

"One of the great qualities of Mr. Roosevelt was his courage. He was courageous as a boy, as a police officer, as a civil service commissioner, as an army officer, as Governor of New York and as President of the United States. He stood for right, for justice and for the same degree of honesty in public affairs. This element of his character brought him friends and supporters in his boyhood, in his college life, and in his public career. It enabled him to impress his personality upon American institutions and to influence our national life.

"Colonel Roosevelt was industrious. He was not compelled to work. Although his parents were not wealthy, they were possessed of means and this fact coupled with the physical condition of Mr. Roosevelt, gave him an excuse for not working. He loved work as well as he loved play, and obtained that enjoyment and recreation out of it which a life of ease and comfort could not have afforded. His industry and his boundless energy led him into many fields of study and scientific investigation. The subjects in which he became interested he usually wrote upon. He has, therefore, been classed as a hunter, sportsman, athlete, historian, essayist, scientist, critic, editor, reformer, explorer and statesman.

"Mr. Roosevelt was never governed in accepting a position by the compensation which it afforded. The determining factor in reaching a decision upon such questions was not, What is the salary? but, What are the opportunities for rendering a genuine service?

"Colonel Roosevelt was not only a forceful character, but he was also an original one. His organization of the 'Rough Riders' in the Spanish-American War, his invention of expressions such as 'rose water reformers,' 'race suicide,' 'nature fakers,' 'Armageddon,' 'my policies,' 'strenuous life,' 'the square deal,' 'the big stick,' 'Ananias Club,' 'undesirable citizens,' and others, and the methods which he employed in dealing with his op-

ponents, so appealed to the public imagination that his skill and ability in this respect were two of his great assets.

"In the death of Colonel Roosevelt, America lost a patriot, a statesman and a citizen unselfishly devoted to every interest of his country."

THOMAS E. FINEGAN.

INFLUENCE OF THE TEACHER ON CITIZENSHIP.

Mr. Roosevelt, speaking at the dedicatory exercises of the new high school building, Philadelphia, Pa., November 22, 1902, said:

"It is, of course, a mere truism to say that the stability and future welfare of our institutions of government depend upon the grade of citizenship turned out from our public schools. And no body of public servants, no body of individuals associated in private life, are better worth the admiration and respect of all who value citizenship at its true worth, than the body composed of the teachers in the public schools throughout the length and breadth of this Union. They have to deal with citizenship in the raw and turn it out something like a finished product. I think that all of us who also endeavor to deal with that citizenship in the raw in our own homes appreciate the burden and the responsibility. The training given in the public schools must, of course, be not merely a training in intellect, but a training in what counts for infinitely more than intellect,—a training in character. And the chief factor in that training must be the personal equation of the teachers; the influence exerted, sometimes consciously and sometimes unconsciously, by the man or woman in so peculiar a relation to the boys and girls under his or her care—a relation closer, more intricate, and more vital in its after effects than any other relation save that of parent and child. Wherever a burden of that kind is laid, those who carry it necessarily carry a great responsibility. There can be no greater. Scant should be our patience with any man or woman doing a bit of work vitally worth doing, who does not approach it in the spirit of sincere love for the work, and of desire to do it well for the work's sake."

Speaking at the University of California, Berkeley, Cal., May 14, 1903, he said:

"Facts tend to become commonplace, and we tend to lose sight of their importance when once they are ingrained into the life of the nation. Although we talk a good deal about what the widespread education of this country means, I question if many of us deeply consider its meaning. From the lowest grade of the public school to the highest form of university training, education in this country is at the disposal of every man, every woman, who chooses to work for and obtain it. The State has done very much; . . . Private benefaction has done much, very much. . . . And each one of us who has obtained an education has obtained something for which he or she has not personally paid. No matter what the school, what the university, every American who has a school training, a university training, has obtained something given to him outright by the State, or given to him by those dead or living who were able to make provision for that training because of the protection of the State, because of existence within its borders. Each one of us then who has an education, school or college, has obtained something from the community at large for which he or she has not paid, and no self-respecting man or woman is content to rest permanently under such an obligation. Where the State has bestowed education the man who accepts it must be content to accept it merely as a charity unless he returns it to the State in full, in the shape of good citizenship. I do not ask of you, men and women here today, good citizenship as a favor to the State. I demand it of you as a right, and hold you recreant to your duty if you fail to give it.

PRESIDENT ROOSEVELT'S ADVICE TO BOYS.

No boy can afford to neglect his work, and with a boy work, as a rule, means study. Of course there are occasionally brilliant successes in life where the man has been worthless as a student when a boy. To take these exceptions as examples would be as unsafe as it would be to advocate blindness because some blind men have won undying honor by triumphing over their physical infirmity and accomplishing great results in the world. I am no advocate of senseless and excessive cramming in studies, but a boy should work, and should work hard, at his lessons—in the first place, for the sake of what he will learn, and in the next place, for the sake of the effect upon his own character of resolutely settling down to learn it. Shiftlessness, slackness, indifference in studying, are almost certain to mean inability to get on in other walks of life. Of course, as a boy grows older it is a good thing if he can shape his studies in the direction toward which he has a natural bent; but whether he can do this or not, he must put his whole heart into them. I do not believe in mischief-doing in school hours, or in the kind of animal spirits that results in making bad scholars; and I believe that those boys who take part in rough, hard play outside of school will not find any need for horse-play in school. While they study just as hard as they play foot-ball in a match game. It is wise to obey the homely old adage, "Work while you work; play while you play."

A boy needs both physical and moral courage. Neither can take the place of the other. . . . A coward who will take a blow without returning it is a contemptible creature; but, after all, he is hardly as contemptible as the boy who dares not stand up for what he deems right against the sneers of his compnions who are themselves wrong. Ridicule is one of the favorite weapons of wickedness, and it is sometimes incomprehensible how good and brave boys will be influenced for evil by the jeers of associates who have no one quality that calls for respect, but who affect to laugh at the very traits which ought to be peculiarly the cause for pride.

There is no need to be a prig. There is no need for a boy to preach about his own good conduct and virtue. If he does he will make himself offensive and ridiculous. But there is urgent need that he should practise decency; that he should be clean and straight, honest and truthful, gentle and tender, as well as brave. If he can once get to a proper understanding of things, he will have a far more hearty contempt for the boy who has begun a course of feeble dissipation, or who is untruthful, or mean, or dishonest, or cruel. than this boy and his fellows can possibly, in return, feel for him. The very fact that the boy should be manly and able to hold his own, that he should be ashamed to submit to bullying without instant retaliation, should in return, make him abhor any form of bullying, cruelty, or brutality.

The boy can best become a good man by being a good boy—not a goody-goody boy, but just a plain good boy. I do not mean that he must love only the negative virtues; I mean he must love the positive virtues also. "Good," in the largest sense, should include whatever is, fine, straightforward, clean, brave, and manly. The best boys I know—the best men I know—are good at their studies or their business, fearless and stalwart, hated and feared by all that is wicked and depraved, incapable of submitting to wrong-doing, and equally incapable of being aught but tender to the weak and helpless. A healthy-minded boy should feel hearty contempt for the coward, and even more hearty indignation for the boy who bullies girls or small boys, or tortures animals. One prime reason for abhorring cowards is because every good boy should have it in him to thrash the objectionable boy as the need arises.

Of course the effect that a thoroughly manly, thoroughly straight and upright boy can have upon the companions of his own age, and upon those who are younger, is incalculable. If he is not thoroughly manly, then they will not respect him, and his good qualities will count for but little; while, of course, if he is mean, cruel, or wicked, then his physical strength and force of mind merely make him so much the more objectionable a member of society. He can not do good work if he is not strong and does not try with his whole heart and soul to count in any contest; and his strength will be a curse to himself and to everyone else if he does not have thorough command over himself and over his own evil passions, and if he does not use his strength on the side of decency, justice, and fair dealing.

In short, in life, as in a foot-ball game, the principle to follow is:

Hit the line hard; don't foul and don't shirk,
but hit the line hard!

ROOSEVELT'S EDUCATIONAL CREED

I believe in education. I believe in giving it free to every man and every woman, because I don't think we can have a successful democracy unless it is an educated one. I believe in making it obligatory so far as primary education is concerned, and I beleve in making it possible for every man or woman who really desires it to have a higher education, but that this shall be permissive and not obligatory. Moreover, I believe that the education shall be an education not only of the mind but also of the soul and the body. I think we should educate men and women toward and not away from what is to be their life work—toward the home, toward the farm, toward the shop, and not away from them. I would use the introduction of a system of universal training and service as a means for securing this education.

I mention education only as one of the aims we ought to have in view in connection with universal training of our citizenship for service. There are very many lines of endeavor in such an effort of constructive statesmanship; for construction and not destruction should be the keynote of our policy at this time. Our educational system should deal especially with all immigrants; and a peculiarly important branch of it at the present time ought to be the training of the disabled and the crippled returning soldiers, so that they may become, not objects of charity, but self-supporting citizens.

HIS ARBOR DAY LETTER TO THE CHILDREN.

Arbor Day (which means simply "Tree Day") is now observed in every state in our Union—and mainly in the schools. At various times, from January to December, but chiefly in this month of April, you give a day or part of a day to special exercises and perhaps to actual tree planting, in recognition of the importance of trees to us as a Nation, and of what they yield in adornment, comfort, and useful products to the communities in which you live.

It is well that you should celebrate your Arbor Day thoughtfully, for within your lifetime the Nation's need of trees will become serious. We of an older generation can get along with what we have, though with growing hardship; but in your full manhood and womanhood you will want what nature once so bountifully supplied, and man so thoughtlessly destroyed; and because of that want you will reproach us, not for what we have used, but for what we have wasted.

For the nation, as for the man or woman or boy or girl, the road to success is the right use of what we have and the improvement of present opportunity. If you neglect to prepare yourselves now for the duties and responsibilities which will fall upon you later, if you do not learn the things which you will need to know when your school days are over, you will suffer the consequences. So any nation which in its youth lives only for the day, reaps without sowing, and consumes without husbanding, must expect the penalty of the prodigal, whose labor could with difficulty find him the bare means of life.

A people without children would face a hopeless future; a country without trees is almost as hopeless; forests which are so used that they cannot renew themselves will soon vanish, and with them all their benefits. A true forest is not merely a storehouse full of wood, but, as it were, a factory of wood, and at the same time a reservoir of water. When you help to preserve our forests or plant new

ones you are acting the part of good citizens. The value of forestry deserves, therefore, to be taught in the schools, which aim to make good citizens of you. If your Arbor Day exercises help you to realize what benefits each of you receives from the forests, and how by your assistance these benefits may continue, they will serve a good end.

THE TWO MATCHES.

ROBERT LOUIS STEVENSON.

One day there was a traveler in the woods in California, in the dry season, when the Trades were blowing strong. He had ridden a long way, and he was tired and hungry, and dismounted from his horse to smoke a pipe. When he felt in his pocket he found but two matches. He struck the first and it would not light.

"Here's a pretty state of things," said the traveler. "Dying for a smoke, only one match left; and that certain to miss fire! Was there ever a creature so unfortunate? And yet," thought the traveler, "suppose I light this match, and smoke my pipe, and shake out the dottle here in the grass—the grass might catch on fire, for it is dry like tinder; and while I snatch out the flames in front, they might evade and run behind me, and seize upon yon bush of poison oak; before I could reach it, that would have blazed up; over the bush I see a pine tree hung with moss; that too would fly in fire upon the instant to its topmost bough; and the flame of that long torch—how would the trade wind take and brandish that through the inflammable forest! I hear this dell roar in a moment with the joint voice of wind and fire, I see myself gallop for my soul, and the flying conflagration chase and outflank me through the hills; I see this pleasant forest burn for days, and the cattle roasted, and the springs dried up, and the farmer ruined, and his children cast upon the world. What a world hangs upon this moment!"

With that he struck the match, and it missed fire. "Thank God," said the traveler, and put his pipe in his pocket.

ARBOR DAY.

Arbor Day means Tree Day. It is no longer an ordinary day, but a special day set aside for the development of a fuller and better appreciation of the value and importance of our trees.

Arbor Day was instituted 48 years ago in Nebraska by Hon. J. Sterling Morton. It was started by a small band of enthusiastic tree lovers in the prairies of the Middle West and is now observed in every State of the Union.

Pennsylvania was originally one of the best timbered states in the East. The original forests covered almost every acre of soil and yielded large quantities of the best lumber in America.

But conditions have changed. Where once stood miles of unsurpassed white pine, hemlock, and white oak, there now remain vast areas producing little or nothing of value. The glorious forests of the Keystone State are gone. They can be renewed by giving proper care to the lands upon which they grew.

We need more and better forests. Nature cannot do the work alone. Man must help in this important business. The first and most essential thing is to stop forest fires. They are unnecessary and destructive.

Forest fires have already made a desert of one-sixth of Pennsylvania. They must be stopped, and the boys and girls in our public schools can undertake no more worthy task than to help protect our fast-vanishing and poorly cared-for forests.

Let every pupil in the public schools of Pennsylvania become a faithful and efficient tree protector. They should also become tree planters for there are many areas now without a satisfactory tree cover. More than 50 million forest trees have already been planted upon idle land in Pennsylvania. There still remain thousands of acres of land in urgent need of planting. The school children of Switzerland helped plant many of the forests which are now among the most famous in the world. May the school children of Pennsylvania begin an equally worthy work which will be a credit to them and a blessing to future generations!—*Gifford Pinchot, Commissioner of Forestry, Commonwealth of Pennsylvania.*

OUR SEVENTY-SECOND ARBOR-DAY

Plant trees on Roosevelt Day. It comes again and again—twice a year we have our Arbor Day in Pennsylvania—but if for any reason, it should not seem convenient to plant your trees on the day named by Governor Sproul, in his Arbor Day proclamation found elsewhere in this number, don't fail to plant on some other day in the early or late fall. It doesn't matter much what the date in October or Novemer so that you get them into the ground. Plant small ones if you have none of good size. The years will take care of them, and it may be that they will thrive and grow all the better for having been very small when put into the ground. Plant fruit trees, and shade trees, and forest trees; plant seeds and nuts; plant vines and shrubs and flowers—anything good that will grow!

An eminent educator says: "Any teacher who has no taste for trees, shrubs or flowers is unfit to be placed in charge of children." Arbor Day has enforced the same idea, especially in those States in which the pupils have cast their ballots on Arbor Day in favor of a State tree and a State flower. Habits of observation have thus been formed which have led youth in their walks, at work or play, to recog-

nize and admire our noble trees, and to realize that they are the grandest products of nature and form the finest drapery that adorns the earth in all lands. How many of these children in maturer years will learn from happy experience that there is a peculiar pleasure in the parentage of trees —forest, fruit or ornamental—a pleasure that never cloys, but grows with their growth."

Luther Burbank ought to be a happy man. It makes you feel glad to look at him. And to read these "Stories of L. B. and His Plant School," by three or four of his admiring friends, is privilege of a high order. Here he is, seventy years young, busy in the Garden of the Lord, working wonders from early morn till dewy evening, making new plants and re-making old ones—a very wizard whose like was never seen before in the history of man. Selection and pollenization are his watchwords, with the patience of hope and care that is unfailing. "Is it true?" Every word of it. Every word of it is simple truth. No deceit or magic here at all. "Can any one do these wonderful things?" There are some who can, and Burbank has shown the open way to amazing results. It is the most remarkable book of the year. You want it for yourself and for your school. Eighty-eight cents will bring it from Charles Scribner's Sons, New York City.

Officials of the leading state institutions were called in October by Governor Sproul for a conference with Gifford Pinchot, commissioner of forestry, in the state Capitol to discuss establishing state and forest tree nurseries on the lands of the institutions.

The demand for trees for planting by municipalities, institutions and the public has exceeded estimates, and in addition numerous companies have offered to undertake big reforestation enterprises if the state will furnish young trees, which it has been doing for years, the consignees paying the cost of boxing and freight. It is estimated the annual demand for forest tree seedlings will reach 20,000,000 in five years.

A special appeal has been made to the heads of institutions to utilize the labor available at such places in the operation of tree nurseries on the ground that it will be both healthful to the patients and useful to the state in its reforestation program. The state is establishing as many additional nurseries on forest reserves as the funds permit, and for the first time in years is using its own seeds in large quantities. The conference will be preliminary to other forestry meetings, which will include a national gathering of forests of various states here in December. The state building and housing conference will be conducted here next week, and in November the second educational congress meets.

Governor Cox says: "I am giving serious attention to the necessary reorganization of the executive departments in the Federal Government. I shall certainly favor the effective administration of affairs relating directly to all matters of human welfare, including education. It should be the province of the Federal Government to extend aid in all lines of education, looking particularly to the removal of illiteracy, the Americanizaion of immigrants, the preparation and proper compensation of teachers, physical education, health and sanitation and the equalizing of educational opportunities to the end that every boy and girl in the United States shall be guaranteed the chance of obtaining a complete practical education. We should extend the advantages of education by a national policy without destroying the effectiveness of local provisions, maintaining that democracy in education which will develop the healthy and reasonable individualism in American national life which enables the citizens of this Republic to think for themselves and thereby find for themselves the solution of their most serious problems."

The Great Eastern Orchard Farm has been sold by C. P. Kibbler to J. P. Stewart, of Milton, a former professor of State College, for $53,000. The orchard is in Codorus township and consists of 120 acres. This is the highest price ever paid for a York farm, and is due to the extraordinary apple crop now maturing. Hundreds of years hence—when people have learned more of fruit growing and forestry and minor matters—what orchards and forests there will be!

Senator Harding in discussing our educational policy says: "I have committed myself to the creation of a department of public welfare as a necessary governmental agency for carrying out effectively a program for the promotion of social justice and human welfare. Obviously, education in all its aspects might be one of the chief concerns of such a department. Indeed, education is so intimately related to every phase of human welfare and to the perpetuity of our free institutions that it must be considered of primary importance in any program for social betterment. The federal government has established the precedent of promoting education. Without interferring in any way with the control and management of public

education by the states the federal government should extend aid to the states for the promotion of physical education, the Americanization of the foreign born, the eradication of illiteracy, the better training of teachers and for promoting free edutional opportunities for all the children of all the people."

When we comprehend the fulness of what death will do for us, in all our outlook and forelook, dying is triumphing. Nowhere is there so fair a sight, so sweet a prospect, as when a young soul is passing away out of life and time through the gate of death—the rosy, the royal, the golden, the pearly gate of death.—*Beecher.*

Ex-president Taft, president of the Unitarian General Conference, told that body at Baltimore that in his opinion the moral tone, the sacrificial spirit of the people which was distinctly elevated during the war has suffered a reaction. "We are back again in the old region of the 'doldrums' where progress to better things seems as slow as it was before the war. We should not be discouraged, however. It is the frailty of human nature. It is to be found in its inability to maintain for long periods its adherence to the highest ideals. Real progress in the world is through a course of action and reaction. This reaction will be succeeded again by an onward and upward movement, and we shall find the world better because of its sacrifices and the lessons they taught. We shall not make the same progress that we hoped for, but we shall step up and on. It is the duty of all those whose disappointment in the present stage of affairs is great, to buckle on their armor and to push toward better things to take their places in the ranks of those who would stir the religious spirit of the community and who would preach as part of their lives the fatherhood of God and the brotherhood of man, and the willingness to sacrifice in order to promote these great principles of Christianity."

THERE is a superstition still prevailing that the teacher is responsible for all the acts of his pupils, whenever or wherever performed—responsible for the way in which they play hop-scotch on Saturday, or recite catechism on Sunday. The home, the church, the school, are the three branches of child-government, and it is not well for one to enroach upon the prerogatives of the other. A bad parent's authority will be respected by the child when a well-meaning but injudicious teacher's intermeddling would be rejected with scorn. When teachers learn that they cannot do everything, they will accomplish more than they do now. A child has an inexpressible admiration of a teacher who can mind his own business; and if a teacher wants to befool and belittle himself in the eyes of his pupils, he can do so by attempting to arbitrate in neighborhood disputes, in Sabbath school differences, and to act the part of high joint commissioner in all the difficulties growing out of the swapping of jack-knives.—*Chicago Teacher.*

The American Forestry Magazine is urging the planting of sycamores for shade trees. It shows that they are of rapid growth and attain large size. It also calls attention to the beauty of the tree—which many people do not really appreciate. In the interest of more beautiful cities, it is desirable that the planting of sycamores be encouraged, the magazine urges. State Supt. Higbee, who introduced Arbor Day into Pennsylvania in 1885, and was an enthusiastic lover of trees, told me once that he had never seen the sycamore grow to nobler size than in Lancaster County. There are thousands of fine sycamores in Indiana and the Middle West, one of the largest at the town of Worthington.

The sycamore requires plenty of moisture, but moisture is easily supplied in a modern city. Besides, the tree has a habit of reaching out after moisture, its roots extending for long distances and going deep into the earth.

Soup kitchens should be established in all schools, says Mrs. Lloyd George, wife of the premier. "We cannot expect to have a healthy nation when children have to study on empty stomachs," she said. She advocated the abolition of slums and the building in future of homes with plenty of fresh air, sunlight and water.

What are the Schools doing? The tendency of the modern young American girl to primp before a mirror, to "doll up" her face with varied cosmetics and artificialities, and to have no thought more serious than the ultramodishness of her attire, was deplored at the Bucks County Teachers' Institute, in annual convention in Doylestown. Anent this topic. Francis B. Pearson, superintendent of public instruction of Ohio, had stern things to say on modern tendencies to "vamping up" to about 400 school teachers and several hundred others who were present. He thinks too many teachers are hypocrites, pretending to teach what they do not know, and too lazy to keep up with their work, much

less in advance of it. There are many who think when they have got a school that they have reached the land of milk and honey. "Many boys," he added, "are going into reform schools because the teachers are not big enough to handle them. Dr. Charles C. Elliott, vice-president of Juniata College, at the same institute, urged the same unfitness of very many teachers, saying, "You cannot make a pupil understand a thing you don't know yourself." This sounds like common sense.

TEACHER PLACEMENT SERVICE.

THE RIGHT TEACHER FOR THE RIGHT PLACE WITHOUT FEE.

OBTAINING suitable teachers for the public schools of the Commonwealth is one of the most important functions of the school officers, and the degree of wisdom exercised in making a choice of teachers frequently determines the success of a school system. The larger the field, from which the choice can be made, the greater the possibility of making a wiser selection. The assistance of some central agency is often necessary in order to secure any breadth of choice. This central agency can devote much of the time in recruiting the most efficiently equipped men and women into the teaching profession.

In order to materially assist school districts in finding suitable persons as teachers in their schools and to provide means by which teachers may find a proper field for the exercise of their training and experience which the State has given them, the Department of Public Instruction at Harrisburg has had in operation the last two months a Placement Service. The service this Bureau renders is without fee of any kind; its sole purpose being to bring the best available material and most efficiently equipped men and women into the class rooms.

Since August 16, 1920, the Teacher Placement Service has had 349 reqeusts for teachers from school authorities in Pennsylvania, distributed as follows: Requests for Principals, 22; High School teachers, 66; teachers in Vocational schools, 38; teachers in Junior High schools, 2; teachers in Continuation schools, 5; teachers in grammar schools, 22; teachers in elementary schools, 30; teachers in kindergarten, 2; teachers in rural schools, 162. Total, 349.

During the brief period in which the Placement Service has been in operation, it has directly or indirectly placed 83 teachers. But six of its registrants have withdrawn from the Service. The credential cards of only four registrants were found to be so poor that the Placement Service could not suggest the candidates for positions.

Certain agencies have rendered a real service in doing this type of work, but not all of these agencies have been motivated by the desire to see the best available, most efficiently equipped teacher properly placed. It has been felt that this type of service should not be left entirely to private enterprise, but should be one of the services rendered by the State Department of Public Instruction. Not only should the State adequately train its prospective teachers, but it should aid in placing them where they can be of most service to the school authorities.

That this Service may function most effectively it is necessary that its registration list of teachers shall be large. Registration cards are provided by which actual and prospective teachers may register. These cards may be secured upon application to the State Department of Public Instruction, Harrisburg, Penna. A request card is also provided for the use of school authorities in making application for teachers. They also may be obtained from the central office.

Superintendents and school officers have been asked to give the widest possible publicity to the Placement Service, bringing it to the attenion of boards of school directors, principals of schools, teachers, and all other persons interested in teaching, thereby rendering a valuable service not only to the teacher and schools, but to the children of this Commonwealth.—*Henry Klonower, Assistant Director, The Placement Service, The Teacher Bureau.*

EDUCATIONAL CONGRESS.

SECOND ANNUAL MEETING AT HARRISBURG IN NOVEMBER.

Doctor Thomas E. Finegan, State Superintendent of Public Instruction for the Commonwealth of Pennsylvania, has announced that the second annual session of the Educational Congress will be held at Harrisburg, November 11, 12 and 13. The Congress is called again this year, with the cordial approval of Governor Sproul.

This Congress will devote its time to the consideration of the report of Colonel Leonard P. Ayres, of the Russell Sage Foundation, on the evaluation of state school systems. Doctor Fingan stated, in

announcing this session of the Congress, that be believed the educational workers and people of the State desire to know the exact points in which the school system of the State is not progressive in order that such remedial action may be taken as appears necessary, to make the school system of Pennsylvania conform to the generally accepted modern and efficient standards.

Governor Sproul will preside at the opening session and will make an address. Colonel Ayres, of the Russell Sage Foundation, who directed the work in connection with the evaluation of school systems of the several states and who prepared the report which is to be considered, will attend the Congress and will deliver the principal address at the opening session.

An advisory committee will be selected to aid in the preparation of a program which shall cover the three days' session of the Congress.

IMPORTANT NOTICE.

STATE REGULATIONS CONTROLLING ENROLLMENT OF CHILDREN.

THE following regulations, promulgated by State Supt. Thomas E. Finegan, are of vital importance and should be regarded promptly by teachers everywhere in Pennsylvania:

"In order to standardize and make uniform the method of recording attendance data in the schools of the State it is required that the following regulations be observed:

"The teacher's roll of pupils belinging to her school shall contain the names of all children assigned to her school from the enumeration list at the opening of the school by the board of education, and such additions as may be made thereto during the term, and no child's name shall be removed from the roll as belonging to the school unless, upon investigation by the local attendance bureau or the proper school offcial, it shall be found that the child

"1. Is deceased.

"2. Has moved from the district.

"3. Is enrolled in another school.

"4. Is legally employed upon a general employment certificate.

"5. Is 16 years of age or over and has withdrawn from school.

"6. Has been certified by the medical inspector as permanently incapacitated and not a fit subject for education and training."

DEPARTMENT SERVICE.

FURTHER appointments in the reorganization of the Department of Public Instruction's activities have been announced by Dr. Thomas E. Finegan, with approval of Governor Sproul. Most of the new appointees began their services on October 1, and it is possible that furtheir appointments will be announced later on. On the list is Dr. J. Lynn Barnard, of Philadelphia who was announced as selected for supervisor of instruction in history, civics and economics a few days ago. The appointments are as follows:

Dr. Owen B. Evans, to be supervisor of contiunation schools, a graduate of Harvard and principal of the continuation schools of Boston for years.

J. D. Blackwell to be assistant director of the bureau of vocational education in charge of agricultural education. He is a graduate of the University of Missouri and is now connected with the Federal board of vocational education.

F. H. Morey to be supervisor of gardens, a graduate of State Collge and now engaged in Chester county.

Miss Meredith Smith to be supervisor of childhood education, lately in charge of such work in the University of Pittsburgh.

J. Y. Shambach, superintendent of the Berwick schools and a Michigan University graduate; John O'Boyle, principal of the Bridgeburg school, Philadelphia, and a Temple University graduate, and W. A. Gensbigler, principal of Beaver Falls High School and graduate of Grove City College, to be assistant directors in the bureau of attendance.

Miss Mildred Fischer, who has been engaged in attendance work in the Philadelphia school system and a graduate of the Girl's Normal School of Philadelphia, was named to a place in the attendance bureau.

Miss Adeline Zachert to be supervisor of school libraries and juvenile literature, who has been engaged in this work in Pennsylvania and also for the United States government. She organized the library system in the Virgin Islands.

Dr. Francis M. Maxfield to be director of the bureau of psychology, a graduate of the University of Pennsylvania and former instructor in the university, now director of psychological work in the schools of Newark.

Miss Muriel Brown to be assistant in the bureau of psychology, a graduate of Vassar and connected with the University of Pennsylvania.

Orton Lowe to be supervisor of instruc-

tion in English, a graduate of Waynesburg College and assistant superintendent in Allegheny county schools.

Dr. F. has also announced the appointment of C. Valentine Kirby, Pittsburgh, as State supervisor of art instruction. He will assume his duties at once. Mr. Kirby, who has been director of art in Pittsburgh schools for several years, was formerly a teacher in Philadelphia. Harry H. Allen, of Philadelphia, has been named supervisor of physical education. He served for years in Philadelphia and Indianapolis schools. Miss Ida M. Holzbauer, formerly connected with a high school in Philadelphia and a graduate of the University of Pennsylvania and New Haven normal school has also been named a supervisor. Miss Helen J. Dodge, graduate of Wisconsin University, and formerly at State College, has been placed in charge of home economics education. Miss Meredith Smith, professor of childhood education at the University of Pittsburgh and a graduate of Chicago and Columbia, has been named supervisor of child study and Dr. Sina Stratton, of Philadelphia, has been appointed supervisor of health instruction in the normal and public schools. Francis B. Hass, of Philadelphia, graduate of Temple University, and the school of pedagogy of Philadelphia, has been appointed assistant director of the teacher bureau.

THE STARRY HEAVENS.

THE cosmos—the universe—the heavens and the earth—infinite reaches of space—endless cycles of time! "And what is man that Thou art mindful of him."

Shall we talk of quadrillions of miles, or trillions, or billions, or millions, or hundreds or tens of thousands, when a thousand, a hundred, or a dozen, would be more within our reach? Dr. John H. Finley tells of an astronomer who risked a guess of 375 quadrillions of miles as the probable distance between two points named—375,000,000,000,000,000!

Go out under the open sky of any starlight night, when the moon is below the horizon, in these shortening days. See the Pleiades, "fireflies tangled in a silver net." See Orion, visible from pole to pole when it is above the horizon, for it is directly over the equator. See stars and star groups that have been noted and named by successive generations, recognized and talked of in familiar acquaintance in many lands for thousands of years. Think of the great stars of Orion, that were known to Job—*six hundred* light years distant from us—and of thousands and millions of stars ranging from not less than three such years to thousands—light always moving at the velocity of 188,000 miles per second.

Then come in and read in this October issue of The Journal, this article on the most stupendous subject of thought and study in physical science that has ever challenged the attention of thinking man. It originally appeared, with numerous illustrations, which we cannot here reproduce, in the August number of the National Geographic Magazine. Read again and again—alternate, if you will at times, between book and starry sky with all its wonders—for the rest of your little life, and day by day and year by year the majesty of Jehovah will grow upon you as in the presence of no other thought you have ever known.

We repeat, in closing, what was said in the Report of the State Educational Association for 1919:

The Report for last year (1918) is worth not one dollar, but many dollars—especially in its Lines of Direction and Distance and its list of stars and constellations—to any one who wishes to take up the magnificent study of the heavens in their stars and star groups; to any gifted and reverent teacher who would encourage life-long familiarity with Orion, the Pleiades, and "all the host of heaven" in the minds of his or her pupils. It is a *vade mecum* in star study, the oldest and grandest of all the sciences, always challenging attention, needing no apparatus for study by any country school beyond the eyes and ears of the teacher and pupils—and yet practically ignored everywhere.

ROTHROCK AND PINCHOT.

WE have long regarded Dr. J. T. Rothrock, of West Chester, the Father of Forestry in Pennsylvania, as perhaps the most useful man in the state. For it is those who work wisely upon the solid foundations who often do most effective work. He has for fifty years been our foremost botanist, and served in the early days on important government exploring expeditions in the Great West. When, after the Civil War, Russia was willing to sell Alaska to the United States, he was sent privately to make report upon its value—nearly losing his life in that work—and, upon his highly favorable report all that territory of valuable resources was bought by Seward for a few millions of dollars. Later he organized the Bureau of

Forestry at Harrisburg, wrote its laws, and when he left it, after long and valuable service as its tireless and enthusiastic chief, upwards of a million acres were under its control suitable for the growing of forest trees. The great work was fairly begun.

Men grow old and vanish, or, at least, retire from active labor when their little day is out. But the good work goes on generation after generation—when once it has been well started and its need is clearly seen—through hundreds and thousands, perhaps millions of years. The forces of forest destruction that have been busy in Pennsylvania for nearly two hundred years have at last been halted, and we have started with clear vision and right purpose upon an era of reforestation, and the conservation of our water supply, and the development of the electrical force that is to furnish the "white coal" needed through endless ages.

The state congratulates Governor Sproul and itself upon the appointment of Gifford Pinchot to the head of this vast interest—and upon his willingness to be appointed to a position in which he can render so great service to the state. Mr. Pinchot is an enthusiastic forester of broad-gauge proportions and of the practical sort. He knows the perpetual menace of fire. He knows it as a tiger always ready for its leap to kill. He would give it no chance, but would have his well organized fire-fighters everywhere and always on the watch—ready "on the second," as they are in the cities. He would have them equipped with telegraph, telephone, and wireless, and all accessories needed for spreading information quickly and putting out fires promptly, before they have become wide-spread conflagrations against which human effort is unavailing. These forest fires now cost the State of Pennsylvania a loss of a hundred millions of dollars each year—which can be and ought to be pervented. Governor Sproul wants an appropriation of a million dollars—or one per cent. of this large sum—for protection against these fires. Gifford Pinchot would be glad to have more. We have, it is estimated, seven millions of acres that are good for nothing but growing forest trees. The million acres already owned have cost between two and three dollars per acre. In coming time, Pennsylvania will grow, under wise management, on this seven million acres, all the timber she will need. May Gifford Pinchot add another million acres or more to our forestry belongings. And when his work is done may the Commonwealth enroll him too for a hundred or a thousand years among her most useful sons.

FROM THE ATTENDANCE BUREAU.

DIRECTOR W. W. Dennison, of the Attendance Bureau of the Department of Public Instruction at Harrisburg, has sent out the following instructions to each Board of Directors, with the request that that the secretary read the same at the next meeting of the Board so that all Directors may know their duty in this matter:

To Superintendents and Board of Education: With the opening of the school year of 1920 it is hoped Pennsylvania will take a decided step forward in enforcing attendance at school. It is not generally known that in a recent study made relative to the educational standing of the several states five of the ten elements involved are essentially problems of attendance. If Pennsylvania is to maintain a satisfactory standing in this classification, it will be necessary, therefore, to insist upon regular and prompt attendance.

The Attendance Bureau has in course of preparation a bulletin on compulsory attendance which should be carefully read by school officials and teachers to the end that the Compulsory Attendance Law shall be enforced. This bulletin will be distributed as soon as printed.

Monthly reports of Attendance will be required from all teachers in the State that the Bureau may know those districts which are failing to enforce the law and that state supervisors of attendance may personally visit such districts. Teachers will in all cases forward these reports monthly to their superintendent. At the opening of schools all boards of education should provide each teacher where necessary with postage and envelopes to forward the reports to the superintendent. To facilitate the work the State Department will furnish the cards upon which these monthly reports are to be made.

All superintendents are requested to see that the Attendance Law is enforced and to report all cases of non-enforcement to the State Attendance Bureau.

It is required that attendance officers be appointed in all first, second and third class districts; all fourth class districts should also appoint an attendance officer either separately or jointly.

Great care should be taken in the appointment of the attendance officer. He should have had at least a common school education. He should be a person of force and character and one who will not allow personal consideration to interfere in any

aside to meet the state's obligations in the increase in teachers' pay.

Payments for the first school year are being completed out of the biennial appropriation on the basis of $50 for each teacher and $1.30 for each pupil in a district. The basis of payments for the term ending July 1, 1919, was $57 a teacher, and $1.45 a pupil. The records of the Department of Public Instruction show that in the last school year there were 46,200 school teachers and 1,776,520 pupils.

The average salary paid male teachers in the public schools in 1919 was $90.69 a month, and for female teachers $61.95. These averages were increased by 25 per cent. in the last year because of the Woodruff salary increases. Teachers who received less than $100 a month were increased 25 per cent.; those getting between $100 and $150 received an increase of 20 per cent., and those receiving between $150 and $200 a month were given an increase of 15 per cent. Those getting more than $200 per month were allowed 10 per cent. increase. In some districts the boards paid more than the minimum allowed by law.

For the 1919-1920 school year the specific appropriations, in addition to the $10,500,000 provided for teachers' salary increases, included: Support of township and borough high schools, $750.000; state aid to normal school students. $850,000; salaries of county superintendents, $315,980; salaries of assistant county superintendents, $298,800; expenses of county superintendents, $66,000; expenses of assistant county superintendents, $84,000; maintenance of state normal schools, $460,000.

The state school employes' retirement board has announced that it has retired 397 persons since the establishment of the retirement system, the average annual final salary of the retired teachers being $864.42, and the average annual retirement allowance $404.08.

Let no district say at the close of the school year in case it fails to secure its state appropriation, "Why did you not tell us the law would be enforced?"

WHAT PENNSYLVANIA PAYS FOR HER SCHOOLS.

SALARIES INCREASED 25 PER CENT. LAST YEAR.

OF the $24,000,000 appropriated by the 1919 Legislature for the public school system of the state, $14,798,780 was specifically appropriated and $9,201,220 was left to be distributed among the common schools for the two school years ending July 1, 1920, and July 1, 1921. Of the specific appropriations, $10,500,000 was set way with the rigid enforcement of the law when necessary. Teachers should report absences to him daily and he should promptly investigate each case.

If Pennsylvania is to maintain her proper place among the states and all the children of all the people receive the benefit of our public schools there must be sincere and wholehearted co-operation among superintendents, boards of education, teachers, parents and all in any way responsible for the enforcement of the attendance laws of the state.

JAMES M. COUGHLIN.

IN the death of James M. Coughlin, at the age of 72, there passes another of the men who have been prominent in educational work in Pennsylvania. For twenty-six years he was at the head of the Wilkes-Barre Schools, and for twelve years previous he was superintendent of the schools of Luzerne county. His early education was in the public schools of this his native county, supplemented by personal study at home. He began teaching at twenty years of age in a country school and showed such fitness for the work that his promotion was rapid, and in 1878 he was elected county superintendent retaining this office until 1890, when he became vice-president of the Bloomsburg State Normal School. In 1892 he was chosen superintendent of the schools of Wilkes-Barre, and retired from this position two years ago because of ill health. He died on Tuesday night, September 22, passing away alone, as Thackeray did, to be found in the late morning calmly asleep. He was known widely as a lecturer much in demand before county and city institutes; he was author of books on English literature and was fond of repeating choice prose and poetry, especially to children in the schools, which they heard with delighted interest; he was also a member of the special Commission appointed to revise and codify the school laws, resulting in the School Code of 1911.

Supt. H. H. Zeiser, who succeeded him in office in Wilkes-Barre, says of him: "In his relations to his own system of schools he was at all times kind and courteous but sufficiently firm to get the best results from his organization. The fact that he was largely self-educated probably made him sense more readily the difficulties and needs of the pupils and enlisted his sympathy in their behalf. He leaves behind him the

biggest monument that any man can leave, the public school system of Wilkes-Barre, organized and perfected to a high degree by his genius. He leaves a place in the hearts of thousands of people, service that has crystalized in public good, a clean and wholesome life, and a family who are a credit to him."

The local press says of him: "The annals of this venerable city will show no more faithful record of service to the people than that of James M. Coughlin, who was actively engaged in teaching and in supervising school work for a period of nearly half a century. Although Mr. Coughlin belonged to the old regime, he was mindful of new processes in education, and he never failed to adopt means that promised progress in educational work. Instead of mourning for the "good old days" he was optimistic of present and hopeful of future weal in our educational system—never insisting that it was perfect, but sincere in his view that the great patronizing public was as well served in the public school system as in any department of public activity.

"Instead of belittling his calling, in an age when the magical call of money seemed ever more potent, he glorified it as a privilege. He will knew that as commercialism grew and flourished the income of the teacher was pitiful in comparison with that of even the inexpert laborer. And yet he adhered to the notion that teaching produces results in mental satisfaction and conscience-reward, equal to any employment known to man. It was just this high view of his calling that carried him along, ever youthful in spirit and efficient, past the term when most men's powers begin to fail.

"The people of this city cannot possibly know or even guess what the value of such a man as James M. Coughlin was, and for that matter still is, in training the minds and aspirations of youth. His character was singularly well balanced and free from even the shadow of taint. He was honorable in all his dealings and many thousands of our citizens reckon gratefully the days when they came under his guidance, for they remember him both as friend and teacher."

MEMORIAL OF WILKES-BARRE INSTITUTE.

The following memorial which was presented by a committee consisting of Thomas Sanlee, K. L. Koerner, P. F. Harvey and J. P. Breidinger, was adopted by the Wilkes-Barre Teachers' Institute at its recent session.

"We think it fitting to record the loss sustained by the Wilkes-Barre City Teachers in the death of Superintendent James M. Coughlin, who answered the final summons on September 22, 1920.

"We are mindful of the fact that Superintendent James M. Coughlin did not belong to us exclusively, but to the State The cause of Education in our state misses the counsels of one of its leaders. The inspiration of his great wisdom, his gentle manner, his earnest zeal, his modest demeanor, his comprehensive grasp of the problems of the day, and his unselfish devotion to all progressive educational movements will ever remain in the hearts and minds of all who were privileged to work under his direction, and enjoy his presence and association.

"He was born in Fairmont Township, Luzerne County, on October 12, 1849; began teaching in the Public Schools of this county; served as County Superintendent from 1878 to 1890; was Vice-Principal of the State Normal School at Bloomsburg for two years; in 1892 was elected Superintendent of the Public Schools of the City of Wilkes-Barre and served until 1918. He was an Institute instructor and lecturer in our own and many other states; for a number of years he was a member of the College and University Council of the State of Pennsylvania; he was President of the Pennsylvania State Educational Association; a member of the Committee appointed by the Governor of our State to revise and codify its School Laws; a member of the Board of Education of the State and a member of the governing body of the reform school at Kis Lyn.

"In the strictest sense of the word he was a self-made man, a life-long student, and as a result of these years of study he was given the degree of Doctor of Philosophy in the regular course, by Grove City College and in recognition of his great service was awarded the honorary degree of Ph. D. by Bucknell University.

"The multiplicity of duties devolving on him from the recognition of his worth by his fellow citizens and co-laborers did not detract in any manner from his great interest and concern in the mental and moral growth of every youth in our city, to whom he always gave the best that was in him.

"We recognize that a great man lived and worked among us, one who has left his impress not only upon the teaching force but upon every young man and woman of this city, and because he has passed away, we express our great sorrow for his loss and extend our kindest sympathies to the loved ones of his family, who are left without the immediate counsel and guidance of his presence."

tary letters from men of literary note poured in upon him; among others, one full of generous encouragement from Washington Irving, dearly prized and carefully treasured to the day of Foster's death. Similar missives reached him from across the seas—from strangers and from travellers in lands far remote; and he learned that, while "O Susanna," was the familiar song of the cottager of the Clyde, "Uncle Ned" was known to the dweller in tents among the Pyramids. Of his sentimental songs, "Maggie by my Side," "Jennie with the Light-brown Hair," "Willie, we have missed you," "Come where my love lies dreaming," and others, are among the leading favorites. The verses to most of these airs were all of his own composition. Indeed, he could seldom satisfy himself in his "settings" of the stanzas of others. The last three years of his life he passed in New York. During all that time his efforts, with perhaps one exception, were limited to the production of songs of a pensive character. He died after a brief illness, January 13th, 1864. His

OLD DOG TRAY.

STEPHEN C. FOSTER.

Moderato.
1. The morn of life is past, And ev-'ning comes at last, It brings me a dream of a
2. The forms I called my own, Have vanished one by one, The loved ones, the dear ones have
3. When thoughts recall the past, His eyes are on me cast; I know that he feels what my
once hap - py day, Of mer - ry forms I've seen Up - on the vil - lage green,
all passed a - way, Their hap - py smiles have flown, Their gen - tle voic - es gone; I've
break-ing heart would say: Although he can - not speak, I'll vain - ly, vain - ly seek, A
Chorus.
Sport-ing with my old dog Tray.
noth- ing left but old dog Tray.
bet - ter friend than old dog Tray.
Old dog Tray's ev-er faith - ful, Grief cannot drive him a -
way, He's gen-tle, he is kind; I'll nev- er, nev- er find A bet - ter friend than old dog Tray.

remains reached Pittsburg a few days later, and were conveyed to Trinity Church, where, on the day following, in the presence of a large assembly, appropriate and impressive ceremonies took place, the choral services being sustained by a company of his former friends and associates. His body was then carried to the Allegheny Cemetery, and, to the music of "Old Folks at Home," finally committed to the grave. Mr. Foster was below medium height, and of slight, well-proportioned frame. His shoulders were marked by a slight droop—the result of a habit of walking with his eyes upon the ground a pace or two in advance of his feet. He nearly always when he went out, which was not often, walked alone. Arrived at the street-crossings, he would frequently pause, raise himself, cast a glance at the surroundings, and if he saw an acquaintance nod to him in token of recognition, and then, relapsing into the old posture, resume his way. For his study he selected a room in the topmost story of his house, farthest removed from the street, and was careful to have the

In some communities the want of an appreciation of music is made very apparent. Selfishness, impoliteness and clownishness, are often manifested to an unpardonable degree when a young lady is called to the piano. The first note struck is taken by the rest of the company as a signal for loud conversation and uproarious laughter. When she has finished, it would often be difficult for many of the company to tell whether she had played the "Danube Waltzes" or "Yankee Doodle." Common civility should, in the parlor or in the concert hall, require at least respectful attention. We are aware that the number of third and even tenth-rate musicians in the world is large. Many young ladies who consider themselves adepts in the art of music seem to regard a discord as satisfactory as a chord. How many "proficients" in music would be speechless from ignorance if called upon to define gamut! how many wonld almost swoon if called upon to run it! And yet, notwithstanding all this, impoliteness or rudeness is quite inexcusable.

The difference in musical taste is sometimes due to a peculiarly nervous constitution, or to the depressed or elated condition of the mind. Grief is often soonest solaced by a lively air; hilarity best controlled by a plaintive one. But, after all, that which influences musical taste, or any kind of taste, most is education. Teach children to admire the sublime and the beautiful in nature. At the home fireside and in the school-room, everywhere, children should be instructed in music. Correct taste in music flings wide the gate to the highway of all that is beautiful, noble and good. Among the fine arts it stands foremost.

THE OLD OAKEN BUCKET.

E. Kaillmark.
Samuel Woodworth.

I. How dear to my heart are the scenes of my childhood, When fond rec - ol - lec - tion pre - sents them to view!
The or - chard, the mead - ow, the deep - tangled wildwood, And ev - 'ry loved spot which my in - fan - cy knew,
The wide-spreading pond, and the mill that stood
The cot of my fa - ther, the dai - ry - house by it, The bridge and the rock where the cat - a - ract fell.
nigh it, And e'en the rude buck - et that hung in the well,
The old oak - en buck - et; the i - ron-bound bucket, The moss - covered buck - et that hung in the well.

That moss-covered bucket I hailed as a treasure,
For often at noon, when returned from the field,
I found it the source of an exquisite pleasure,
The purest and sweetest that nature can yield.
How ardent I seized it, with hands that were glowing,
And quick to the white-pebbled bottom it fell,
Then soon, with the emblem of truth overflowing,
And dripping with coolness, it rose from the well.
The old oaken bucket, the iron-bound bucket,
The moss-covered bucket arose from the well.

How sweet from the green, mossy brim to receive it,
As, poised on the curb, it inclined to my lips!
Not a full-blushing goblet could tempt me to leave it,
Tho' filled with the nectar that Jupiter sips.
And now, far removed from the loved habitation,
The tear of regret will intrusively swell,
As fancy reverts to my father's plantation,
And sighs for the bucket that hung in the well;
The old oaken bucket, the iron-bound bucket,
The moss-covered bucket which hangs in the well.